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Special Inaugural Session on “Key Issues”

L-1

Ambumani Ramadoss
Hon'ble Minister for Health & Family Welfare, Govt. of India

L-2

WHO Goodwill Ambassador for Leprosy Elimination, and Japanese Government Goodwill Ambassador for the Human Rights of People Affected by Leprosy

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Leprosy has been eliminated as a public health problem in every country except Nepal, Mozambique, the Democratic Republic of Congo and Brazil. While these four strive to reach this milestone, others work to sustain the achievement, further reduce the number of new cases and tackle other leprosy-related problems. In order to “eliminate” leprosy in the true sense of the word, we cannot focus on the medical aspects of the disease alone. We must also deal with the social aspects, such as the associated stigma and discrimination. Ignorance and myths surrounding leprosy over the centuries have helped perpetuate prejudice, marginalizing people affected by the disease. Once affected, a person, and often his or her family members, remains stigmatized and ostracized, even after being cured. As a motorcycle needs two wheels of an equal size to function, there should be a good balance between a front wheel of medical treatment and a rear wheel of social intervention if there is to be a complete cure. Belatedly, I realized the importance of addressing the social aspects of leprosy. First, I visited the UN Office of the High Commissioner for Human Rights in 2003 to draw attention to the issue. Subsequently, I lobbied the then-UN Human Rights Commission and its Sub-Commission. This led to three non-binding resolutions at the Sub-Commission requesting governments and international agencies to take actions to abolish social discrimination against people affected by leprosy and their families. Together with the Japanese Government, which has echoed my efforts, I am now asking the recently constituted UN Human Rights Council to discuss the issue as a formal agenda item, and hope that eventually the UN General Assembly will pass a binding resolution and set guidelines for protecting the human rights of leprosy-affected people. Approaches such as this at the policy-making level are not enough, however. We also need to carry out activities on the ground. These include: a) disseminating correct information about leprosy; b) campaigning to abolish discriminatory social customs such as use of the word “leper”; and c) providing opportunities for education and employment for people affected by leprosy (the aim of the recently established Sasakawa-India Leprosy Foundation). In these efforts to bring about social change from both “above” and “below,” people affected by leprosy must be partners in this process. Over time, I wish to see them play the leading role. This is the way forward for people affected by leprosy to achieve social integration and economic independence, and regain their dignity.

L-3

Making Leprosy History

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This is a historic moment: leprosy, a disease already mentioned in texts more than 2000 years ago, is on the brink of elimination. This month the last International Leprosy Congress will be held in Hyderabad. Scientists, politicians, the World Health Organization (WHO), nongovernmental organizations (NGOs) and private-sector foundations have combined their efforts for a final push against the disease. These groups have worked together to make leprosy diagnosis and free treatment available at the village level within primary health facilities in areas where the disease occurs. This approach has proved to be a highly effective way to treat patients, and has led to one of the greatest public health success stories in the world. Today there are only four countries in the world where the prevalence of leprosy exceeds one case per 10 000 inhabitants, compared to 122 countries in 1985. Globally, we have made tremendous progress, but the battle has not yet been completely won. Tackling residual problems requires learning from past successes and failures, as well as having a clear understanding of the remaining obstacles. **The changing face of leprosy** : Leprosy has always been more than just an infectious disease. It was considered to be a malady of the whole body as well as a disease of the soul, with disastrous consequences for those who became infected. It was a shameful

affliction, brought about by wrongdoing in a previous life, through a curse of God or witchcraft – in short, a punishment. Sufferers were ashamed of their condition and tried to hide the disease for fear of social repercussions. Lack of treatment or delayed treatment increased the risk of disabilities that, in turn, strengthened and perpetuated the stigma of the disease – a vicious cycle. Before we developed an effective cure for leprosy, society dealt with the disease by isolating leprosy patients. In virtually every society, those affected by the disease were cast out of their families and communities to live in leprosaria, segregated villages, for fear of the disease spreading. Leprosy affected most often the poorest of the poor, leaving them without means to support themselves and forced to depend on underfinanced and understaffed leprosy colonies for their care.

Since the early 1980s, the face of leprosy has changed dramatically, however, thanks to the development of a curative treatment and its increasing availability, free of charge, to patients. Multi-drug therapy (MDT), the treatment recommended by the WHO, cures leprosy patients, interrupting transmission of the disease after the first dose of medication and preventing disabilities. Even patients with the severest form of the disease experience visible clinical improvement within weeks of starting treatment. Around the world, various groups have made an effort to change the image of leprosy and encourage patients to seek timely treatment. To remove the stigma associated with deformities, their prevention, correction and rehabilitation are being integrated into general health services. Innovative communication approaches, including mass media, combined with improved access to treatment have both heightened awareness of the free and effective cure and dispelled some of the disease's stigma. As a result, patients are seeking diagnosis and treatment at an earlier stage. Hopelessness and despair are giving way to the idea that leprosy can be just another chapter in a person's life. As communities witness the impact of MDT, age-old prejudices have begun to change and, with them, societal norms. Discriminating customs are fading in communities that have seen people cured through MDT. Based on estimates from the WHO, Novartis MDT donation helped cure about 4.5 million patients in the past seven years. Nearly all of the global supply of MDT is provided by a collaboration between the WHO and Novartis, a Swiss healthcare company. Since 2000, Novartis has supplied more than 37 million blister packs at a cost of about USD 64 million. The company has committed to work with the WHO to provide free treatment for all leprosy patients in the world at least through the end of 2010.

Adequate supplies of free, high-quality MDT will help to ensure that the remaining endemic countries reach the elimination target, and that other countries continue their progress. In line with the disease burden, most of the MDT medicines are destined for Asia, with a substantial share for India, which until recently accounted for about two-thirds of new leprosy cases worldwide. While India's outstanding success over the last five years in reducing its share in the global burden of the disease has proven the essential soundness of the elimination strategy, the country still produces a significant number of new leprosy cases each year.

A hopeful new outlook in India : Throughout its involvement in leprosy treatment and control, the Novartis Foundation for Sustainable Development has pioneered unconventional approaches with a profound impact on the way the disease is combated. Many of these approaches are now incorporated into the disability care packages of both the government and NGOs in India. In addition, the Novartis Comprehensive Leprosy Care Association (NCLCA) pioneered a system of prevention, correction, care and rehabilitation based on simple modalities that can be mastered by general healthcare staff. Since its inception, NCLCA has worked to integrate disability care into mainstream health services. The program provides integrated leprosy care, including improved access to MDT treatment, field-based disability care services and reconstructive surgery and rehabilitation where required. The social and economic reintegration of patients into their communities is also an important objective for the NCLCA. Disabilities remain the most important factor for social stigmatization of leprosy. By far the best way to prevent these is through early detection of the disease and treatment with MDT. However, because of delays in starting treatment, improper management of leprosy reactions and patients from the pre-MDT period, India is still home to many patients disabled by leprosy. Depending on the nature of the disability, most can be corrected or cared for and any further physical deterioration prevented, but the requirement is substantial as each disabled person may have more than one deformity and may need multiple services.

Training surgeons in reconstructive surgery, conducting camps and workshops, devising simple techniques and transferring technology have all served to bring treatment closer to the leprosy-disabled and have accelerated their integration into the general health services. Services from the NCLCA have benefited thousands of patients who would have developed inoperable deformities and handicaps without help.

The NCLCA's focus on income generation and moral support for economic rehabilitation has transformed the lives of many of the poorest of the poor affected by leprosy. As these patients gain the ability to earn a living and support themselves, social acceptance and integration back into their communities improves drastically.

The work of the NCLCA is far from over but its efforts have ensured that, thanks to comprehensive care, leprosy in India is no longer a life sentence.

Moving toward eradication of leprosy : The progress we have made in curing leprosy and caring for leprosy-affected patients would not have been possible without a team of dedicated, talented people. By bringing such diverse groups together and involving them in the entire process – from drug development to free provision to leprosy patients worldwide – we have transformed leprosy treatment. The teamwork between the WHO, health ministries, NGOs and communities has broken new ground in building public-private partnerships.

Leprosy elimination is indeed a major public health success story. About 20 years ago, fewer than 5% of patients were on treatment with MDT; today, every patient in the world is receiving MDT free of charge through the WHO–Novartis collaboration. As Mahatma Gandhi recognized, “Leprosy work is not merely medical relief; it is transforming frustration of life into joy of dedication, personal ambition into selfless service.”

We regard it as a privilege to contribute in the effort to realize the vision of a world without leprosy. This will require a continued, concerted effort by all parties to sustain the substantial gains made so far and to take leprosy elimination to the next step and focus on elimination at the sub-national level. We must retain a sense of urgency as we only have a small window of opportunity to do so in view of other pressing health demands.

Leprosy control is at a critical juncture: the disease has a very limited spread, and thus the level of international attention and political commitment tends to be lowering. However, the disease still exists and can resurge. The next step in leprosy control is to move toward eradication. Working together with governments and partners should make it possible to eradicate leprosy and consign the disease to history.

L-4

Noorein Kaleeba

L-5

Key Issues in Leprosy Control – An ILEP Perspective

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Over the last 40 years, ILEP Members have helped cure many millions of people affected by leprosy and continue to support vital leprosy work in more than 80 countries. In addition to the treatment provided, ILEP Members have also helped to prevent disability, reduce stigma and discrimination, and restore dignity to those affected. A significant development in the continuing fight against leprosy has been the collaboration and sharing of expertise between the World Health Organization, ILEP and other leading authorities, on the promotion of *Operational Guidelines* to implement the WHO *Global Strategy for Further reducing the Leprosy Burden and Sustaining Leprosy Control Activities: 2006 -2010*. These Guidelines represent an important tool with which to continue the integration of sustainable leprosy activities with other health services. For ILEP, the Strategy's aim of further reducing the leprosy burden demands four key elements be pursued: • Maintenance of essential leprosy services and diagnostic and treatment skills. • Emphasis on the WHO Global Strategy indicators of New Case detection and Treatment Completion. • Avoidance of prevalence or case detection based operational targets for field workers and emphasis instead on achieving quality targets which can reflect both the timeliness of detection and the quality of patient management. • Increased efforts to prevent disability, assist with rehabilitation and fight against stigma. ILEP continues to promote and stimulate collaboration between all stakeholders involved in leprosy work. Members work closely with associations of leprosy affected people, non-governmental organizations and governments of endemic countries. In all of these collaborative partnerships, ILEP maintains an evidencebased and patient-centred, holistic approach. Scientific research, in its basic, applied and operational aspects, remains a vital element of ILEP-supported work. Human rights are central to the approach of ILEP Members and more needs to be done to promote the rights of people affected by leprosy within the broader context of the important new Convention on the Rights of People with Disabilities adopted by the United Nations General Assembly in 2006. ILEP also continues to build on its long-term goal of a world without leprosy by promoting broader support to development issues. Conscious of the links between poverty and leprosy, ILEP Members are working for the achievement of the United Nations.

L-6

M Htoon
SEARO-WHO, New Delhi, India

Guest Lectures

L-7

Understanding Pain

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Pain is defined by IASP as "...an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage". Pain can be classified in relation to its physiopathologic mechanism as: **nociceptive** is pain due to activation of peripheral nociceptive nerve terminals, **neuropathic** is pain due to lesion or dysfunction of the nervous system and psychogenic pain is rare and the diagnosis must be founded on positive psychopathogenic bases.

Diagnosis : For nociceptive pain, diagnosis is done through clinical history, with questions trying to enumerate the subjacent causes of pain, such as inflammatory pathologie. For neuropathic pain, in spite of the large number of etiologies, clinical manifestations of the syndromes are relatively uniform. Nervous lesions that lead to neuropathic pain can vary, occurring in the peripheral as well as in the central nervous systems, and often concomitantly. **Nociceptive Pain Mechanism** : The first step is the transformation of intense physical or chemical environmental stimuli in action potentials, which are carried from free nerve endings through fine nerve fibers to the central nervous system, where they are modulated, integrated in different levels of the neuroaxis and finally interpreted in the cerebral cortex. In tissue lesion, countless substances are released (bradykinin, acetylcholine, glutamate, adenosine, prostaglandins, etc). When the inflammatory process lasts, changes in the plasticity of the central and peripheral nervous systems occur, facilitating the perpetuation of pain independent of the stimulus intensity.

Neuropathic Pain Mechanisms : In the PNS neuropathic

pain can appear as a consequence of direct lesion of the axons. Such lesion can lead to ectopic discharges which will reach the central nervous system, where they will be interpreted as pain originating in the region of the corresponding innervations. The central mechanisms involved in the neuropathic pain are related to an unbalance between the pain impulse inhibition control and transmission facilitation mechanisms. **Clinical Condition** : Nociceptive pain may present a "mechanical" when pain is worsened during the day or an "inflammatory" rhythm when pain is aggravated during rest. Neuropathic pain can present itself spontaneously, continuously, generally described as a "burning or undefined sensation" or paroxysmal as "shocking, stitching, shooting or acute", or still in both forms concomitantly. **Physical Exam** : Physical and neurological exam will determine the topography of the lesion, the level of damage and the type of the damaged nervous fibers. By testing sensitivity, we can also identify conditions of hyperalgesia and allodynia. **Treatment** : Pharmacological therapy is the first strategy to fight pain but not the only one, and there is evidence suggesting that early treatment of acute pain may prevent the development of chronic pain. Pain treatment should not be restricted to analgesic drugs. Physical medicine and rehabilitation programs, as well as several psychotherapy support techniques or surgeries in the pain modulation centers and even some alternative therapies in their due cultural contexts may benefit the patient in the recovery of their bio-psycho-social well-being.

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Leprosy, a chronic, neurological human disease, results from infection with the obligate intracellular pathogen *Mycobacterium leprae*, a close relative of the tubercle bacillus. *M. leprae* has the longest doubling time of all known bacteria and has never been cultured in the laboratory. Comparison of the 3.27 Mb genome sequence of an armadillo-derived Indian isolate of the leprosy bacillus with that of *Mycobacterium tuberculosis* provides clear explanations for these properties, revealing an extreme case of reductive evolution. Less than half of the genome contains functional genes while pseudogenes, with intact counterparts in *M. tuberculosis*, are abundant. Gene deletion and decay have eliminated many important metabolic activities including siderophore production, part of the oxidative, and all of the microaerophilic and anaerobic respiratory chains, together with numerous, alternative catabolic systems and their regulatory circuits. Genome decay has thus led to metabolic crippling. In the 1990s, it was thought that the elimination of leprosy was possible thanks to the massive implementation of multidrug therapy by the World Health Organisation. While over twelve million patients were cured, the incidence of the disease has not declined and remains stubbornly high at around 600,000 new cases annually. Better means of diagnosis and improved understanding of transmission are thus required. Using post-genomic approaches we are developing both an immunodiagnostic test for infection and epidemiological tools. Diagnosing leprosy is often difficult as the disease exists in different forms. At one end of the spectrum is lepromatous leprosy, characterised by numerous lesions, a high bacillary load and humoral but not cell-mediated immunity, while tuberculoid leprosy is at the other. Patients with the tuberculoid form of disease present with few lesions, where bacteria are seldom detectable, and have weak antibody responses but strong cellular immunity. Comparative genomics led to the identification of antigenic proteins that are restricted to the leprosy bacillus or of limited distribution, and these have been used in a whole blood assay to stimulate antigen-specific interferon-gamma production by lymphocytes. In conjunction with an antibody-based test for lepromatous leprosy it is now possible to detect most forms of the disease although there are still problems distinguishing between cases of infection or simple exposure to the pathogen. Indeed, the remarkable frequency of immune responses in healthy contacts suggests that transmission of *M. leprae* is far more common than believed and this underlines the necessity for improved means for tracking the disease. To develop tools for molecular epidemiology, we sequenced the genome of a Brazilian isolate of *M. leprae*, chosen because of the high prevalence of leprosy in that country and its great distance from India. In light of the extensive gene decay observed in the Indian strain multiple examples of pseudogene formation and numerous single nucleotide polymorphisms (SNP) were expected. Astonishingly, the two genome sequences were nearly identical differing by a single pseudogene and a mere 118 SNP, distributed almost equally between genes and pseudogenes. On surveying over 300 leprosy biopsies, 78 SNP were found to be informative. Phylogenetic studies revealed that all extant cases of leprosy are attributable to a single clone of *M. leprae* whose dissemination worldwide could be retraced from SNP analysis. The disease seems to have originated in Eastern Africa or the Near East and spread with successive human migrations. Europeans or North Africans appear to have introduced leprosy into West Africa and the Americas within the past 500 years.

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Leprosy is a chronic infectious disease with a strong host genetic component caused by *Mycobacterium leprae*. By employing forward genetics approaches, we have been able to identify two major genetic risk factor of leprosy susceptibility. A first set of risk factors is located in the *PARK2/PACRG* shared promoter region on chromosome region 6q25. In addition, the investigation of a linkage peak (LOD=2.7) on chromosome region 6p21 identified in a previous genome-wide linkage scan led to the identification of a second genetic risk factor. In 194 Vietnamese simplex families, the initial association scan of a 10.4 megabase region underlying the linkage peak targeted the *lymphotoxin-α* (*LTA*) gene for high-resolution association studies. All SNPs in the bin containing the functional *LTA*+80 variant (AA/AC vs. CC $P=0.007$; OR=1.74 [1.16-2.60]) were associated with leprosy. The association of *LTA*+80A was replicated in a second independent sample of 104 Vietnamese simplex families ($P=0.003$; OR=2.34 [1.27-4.31]). When stratifying on age at diagnosis, the association of *LTA*+80 was captured almost entirely by cases diagnosed before age 16 ($P=0.00004$), reflecting significant genetic heterogeneity of the *LTA*+80 effect between cases <16 years and those ≥16 years ($P=0.00054$). In the second Vietnamese sample, the odds-ratio similarly increased in cases <16 years (OR=5.31 [1.19-23.60]) resulting again in significant evidence for heterogeneity ($P=0.04$). When both samples were combined, the evidence for association overall and in cases <16 years was very strong ($P=0.000024$ and $P=0.0000004$, respectively). In a third sample of 364 cases and 371 controls from Northern India, the association of *LTA*+80A was replicated ($P=0.01$; OR=1.60 [1.10-2.33]) using multivariate analysis. The strength of association increased in the youngest age group ($P=0.004$; OR=2.95 [1.32-6.58]) replicating the age-effect and genetic heterogeneity ($P=0.003$) observed in the Vietnamese samples. A careful comparison of linkage disequilibrium pattern of SNPs in the *LTA* region between the Vietnamese and Indian samples provide further support for *LTA*+80A as the causative leprosy susceptibility variant.

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Genetic basis for interindividual variation in susceptibility to human diseases involves a complex array of immune regulatory genes with variants that impose subtle but significant consequences on gene expression or protein function. Recent upsurge in knowledge concerning immunological display of antigenic peptides by HLA for T cell recognition is crucial in understanding disease pathogenesis. Other candidate genes like TLR2, PARK2 and PACRG have also been defined for their possible biological role in governing susceptibility/resistance to mycobacterial infections. Further, a non-targeted genome-wide linkage analysis has helped in identification of positional candidates like Chromosome 10p13. A gene that lies at the peak of this linkage is the macrophage mannose receptor (MRC1), which has a role in the processing of glycolipids derived from mycobacteria. Our study deals mainly with the identification of specific HLA motifs and supertypes responsible for restricting T cell responses in infectious diseases and identification of immunogenetics markers, which might be associated with disease susceptibility. Studies from our laboratory have shown existence of several novel alleles and unique haplotypes in the Asian Indian population. This extreme molecular diversity in MHC in Asian Indians has been driven by racial admixture and microbial pressure. The studies on the molecular diversity of MHC in mycobacterial diseases in North Indians have delineated an association of HLA-DRB1* 15/16 (DR2) both with tuberculosis as well as leprosy. Further analysis based on HLA-DR restricted supertypes has revealed an important role of negatively charged 'pocket 4 motif' residues (D70, E71, A74) in tuberculosis. This is in contrast to our observation in tuberculoid leprosy where the pocket 4 binding is influenced predominantly by 'Arg rich motif' at position 13,70/71 of the DRB1 molecular. Additionally, we found that the Val/Gly dimorphism of 'pocket 1' of the peptide binding groove of HLA-DRB1 influences disease severity. It is possible that the net charge of peptide binding motifs in these pockets might have distinct influence on epitope binding and constitute important information in vaccine design. Our data suggest that the critical epitopes must contain at least three distinct class II MHC binding motif matches for efficient binding. Bioinformatics tools such as Epimatrix and Conservatrix to name a few could be applied for identifying unique or multi HLA restricted (promiscuous) T cell epitopes that are conserved across variant strains of the pathogen. These approaches offer a significant advantage to develop novel vaccines/therapeutics for the prevention and treatment of infectious diseases.

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Introduction: Leprosy is a chronic infectious disease caused by *Mycobacterium (M.) leprae*. The Mitsuda reaction is a delayed granulomatous skin reaction elicited by intradermal injection of heat-killed *M. leprae*. Interestingly, even in areas not endemic for *M. leprae*, results of the Mitsuda test are positive in a substantial proportion of individuals. Like leprosy, the Mitsuda reaction is thought to be genetically controlled, but its mode of inheritance is unknown. **Methodology:** We performed a model-free genome-wide linkage analysis for the quantitative Mitsuda reaction in 19 large Vietnamese families with a history of leprosy (114 offspring) in order to identify and locate the major genetic factors influencing the extent of the Mitsuda reaction. **Results:** We identified 2 regions with suggestive linkage to quantitative Mitsuda reactivity: 17q21-25 and 2q35 (SLC11A1 locus). Notably, the high estimates of heritability for these 2 loci are indicative of large QTL effects. Both regions harbor genes previously reported to be linked and/or associated with mycobacterial or other granulomatous diseases. Interestingly, when the present study performed analyses in the subset of 60 healthy offspring, the same linkage regions were identified—albeit with lower significance because of smaller sample size. **Conclusions:** These findings, coupled with the observation that, regardless of the endemicity of leprosy, the distribution of Mitsuda-reaction values is similar across countries [3], support the view that the importance of this phenotype extends well beyond the field of leprosy. Given the high proportion of Mitsuda-reaction variability explained by the 2 regions identified here, additional association studies to identify the underlying genes will be of considerable importance to our understanding of in vivo granuloma formation.

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Leprosy is a complex disease where host genetic background control susceptibility and severity outcome. A balance of efficient cellular immune activation with a predominant production of cytokines from IL-12/23-IFN γ axis are critical to control intracellular growth of *Mycobacterium leprae* as any other intracellular pathogen. Tumor necrosis factor (TNF) is another critical mediator of granuloma formation and control of bacilli spread synergizing with IFN γ /IL-12 to hamper *M. leprae* infection, while interleukin-10 (IL-10) has an antagonistic role. To evaluate genetic associations in leprosy, studies have been performed based on case-control design using candidate genes like TNF and IL-10. Moreover, genomic scans using family-based designs identified chromosome regions as novel candidates to be tested for association. Thus far, genes clustered in 6p21 region, like tumor necrosis factor (TNF), lymphotoxin-alpha (LTA) and human leukocyte antigen (HLA) have been consistently associated with leprosy in different populations like Indians, Brazilians, and Vietnamese. On the other hand, genetic variations in interleukin-10 (IL-10) were also replicated in association with leprosy. The 6p21 genes and IL-10 are critical immunological regulators, associated with either protective (TNF, LTA, and HLA) or susceptible (IL-10) responses against *M. leprae*. Thus, epidemiological data suggest that a genetic background regulating the ratio of TNF-LTA/IL-10 could be crucial to outcome of leprosy. Even though, the biological significance by functional studies still needs strong confirmation in order to provide genetic markers to screen high-risk populations and improve prophylactic actions.

Genetic Epidemiology of an Isolated Leprosy Population from Northern Brazil

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Leprosy is a complex disease where host genetic background control susceptibility and severity outcome. A balance of efficient cellular immune activation with a predominant production of cytokines from IL-12/23-IFNG axis are critical to control intracellular growth of *Mycobacterium leprae* as any other intracellular pathogen. Tumor necrosis factor (TNF) is another critical mediator of granuloma formation and control of bacilli spread synergizing with IFNG/IL-12 to hamper *M. leprae* infection, while interleukin-10 (IL-10) has an antagonistic role. To evaluate genetic associations in leprosy, studies have been performed based on case-control design using candidate genes like TNF and IL-10. Moreover, genomic scans using family-based designs identified chromosome regions as novel candidates to be tested for association. Thus far, genes clustered in 6p21 region, like tumor necrosis factor (TNF), lymphotoxin-alpha (LTA) and human leukocyte antigen (HLA) have been consistently associated with leprosy in different populations like Indians, Brazilians, and Vietnamese. On the other hand, genetic variations in interleukin-10 (IL-10) were also replicated in association with leprosy. The 6p21 genes and IL-10 are critical immunological regulators, associated with either protective (TNF, LTA, and HLA) or susceptible (IL-10) responses against *M. leprae*. Thus, epidemiological data suggest that a genetic background regulating the ratio of TNF-LTA/IL-10 could be crucial to outcome of leprosy. Even though, the biological significance by functional studies still needs strong confirmation in order to provide genetic markers to screen high-risk populations and improve prophylactic actions.

Nerve Damage and Repair

Gigi Conforti

Transforming a Negative Legacy Into Historical Sites That Benefit Family and Community

Jack Maurice Obonyo

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Discrimination against people challenged by leprosy and their families is still widespread in Kenya and throughout the world. In 2007, oral history conducted with individuals in Kenya revealed widespread human rights violations. People are denied the right to a decent burial · People are denied the right to property and land ownership · People are denied the right to free movement and association · People are denied the right to an honorable marriage. Dorcas Akoth is a widow who lives in Nyamanga village, Suba District, Kenya. She lives with the family of her younger brother but her house is built away from the main homestead. Her husband died before she contracted leprosy, leaving her with two sons. One of the sons died and the other one abandoned her. She was chased away from the village where she lived with her late husband. When asked why she left her home to live with her brother's family, she said: "They chased me away and disinherited me of everything. My son was so ashamed of me that he would not call me Mama. He has never come to see me." When asked what will happen when Dorcas dies, her sister-in-law commented: "When she dies, we will bury her away from the homestead. Her house will be burned, her belongings will be left on the road. It is taboo to inherit anything from somebody with her disease." In Kenya, we are encouraging young people, the next generation whose parents or grandparents have been challenged by leprosy, to accept their family's history and discuss it openly without fear. Instead of running away from their history, we are encouraging them to promote their history through tourism. In this way, they can use history to support their families instead of accepting the negative legacy which so often results in poverty and people begging on the streets. The youth were advised to identify sites where their relatives who had leprosy were buried without honor. Currently, some burial sites that were previously abandoned are in the process of being fenced in and promoted for community based tourism through the Kenya Tourism Trust Fund and the Abasuba Community Peace Museum. Young people have been shown how community based tourism can change their lives while bringing honor and acceptance to their families. As part of this effort, we have stressed that all of the history of the older generation must be documented for the education of future generations. Through education and tourism, the negative legacy of leprosy can be transformed into a positive message of pride and honor. We hope that this is something that will be carried out by the younger generation on a global level as an important means of removing the stigma of leprosy while at the same time providing a means by which the younger generation can support themselves and their family members who have had leprosy.

Plenary / Split Plenary Sessions

S-I : Achievement in Leprosy Elimination and Future Leprosy Work-Global & National Perspectives (Symposium)

L-16

Achievement in Leprosy Elimination and Future Leprosy Programme – India's Perspective

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The National Leprosy Eradication Programme has seen many achievements during the last decade which saw the programme reached elimination of leprosy as a Public Health Problem at the national level. This achievement was possible due to proper planning and hard work by all involved in the programme with strong political commitments, infrastructural facilities and availability of adequate resources. The national programme received valuable support while working together with the partners like WHO, ILEP, Nippon Foundation, Novartis, National NGOs and others. During this period the leprosy services were integrated with the General Health Care system. NLEP is still a centrally sponsored program and is a component of public health services under the over all umbrella coverage of National Rural Health Mission. During the 11th Five year plan period referral services are being strengthened by involving PMR departments of medical colleges. Opportunities of village health & sanitation committee and Rogi Kalyan Samiti, under NRHM are being utilized. Quality of services has been given higher emphasis under the new paradigms and monitoring & supervision has been streamlined. New case detection rate and the Treatment Completion Rates are the main epidemiological indicators. Inter & intra departmental coordination and inter – ministerial links and periodic review meetings with state program officers helped in solving many problems. Decentralized district plans, flexi funds and logical approach will further help in steering the program in right direction.

L-17

Maria Leide

L-18

M Htoon
SEARO-WHO, New Delhi, India

L-19

Achievements of Leprosy Elimination and Future Leprosy Work : Global and National Perspectives

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The introduction of MDT in 1982 followed by the progressive implementation of short, fixed duration chemotherapy gradually reduced the numbers of leprosy patients registered for treatment. The World Health Assembly Resolution of 1991 accelerated this decline through an intensified elimination strategy. Important components of this strategy were simplified diagnosis and classification, and improved delivery and access to a high quality drug supply free at the point of delivery. However many components of this intensified strategy while successfully attaining the 2000 elimination target were unsustainable. The 'final push' strategy continued the momentum in a number of countries but a new, sustainable strategy was needed to maintain the elimination achievements, sustain access to quality leprosy services, and further reduce the burden of leprosy. We are now in a new era, more than 7 years on from elimination. The successes of elimination are in danger of leading to complacency and the evidence at various levels indicates we are failing to deliver sustained, accessible and quality services for leprosy patients. While we can celebrate the achievements of the last century, we need to wake up to the realities of the 21st Century otherwise we are in danger of witnessing the reversal of everything that has been achieved. The WHO strategy 2006 – 2010 sets out a new strategy fit for purpose – a strategy that emphasises quality and accessible services at a local and a referral level, human rights and participation by those affected and their communities, and tackles both the physical and the social consequences of disease. Quality leprosy services are defined as those accessible to all who need them with high coverage and no geographical,

economic or gender barriers. Quality services need to be patient-centred and observe patients' rights, including rights to timely and appropriate treatment, and to privacy and confidentiality. The services need to be evidence based and include each aspect of case management – diagnosis, treatment, management of reactions, prevention of disability, referral for complications and rehabilitation as well as skill transfer for self-care. The challenge is now the implementation of that strategy – operational guidelines have now been produced and a training programme for national programme managers is now being rolled out so that programme managers, WHO, ILEP and those affected by leprosy, can work together to further reduce the leprosy burden at local, national and global levels.

L-20

Achievements of Leprosy Elimination and Future Leprosy Work : Global and National Perspectives : Presentation by Nippon Foundation

Y Yousa

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The Nippon Foundation (TNF) previously known as JSIF started its involvement in global leprosy programme in 1974, because of its founder and the first President, Mr. Ryoichi Sasakawa, had a deep concern over the welfare of leprosy patients because of his own personal experience as a child. On his 75th birthday, he decided to make contributions to the leprosy problems, more systematic by utilizing his personal as well as JSIF's huge fund through two channels, one through the Leprosy Unit of WHO HQ in Geneva, and the other through newly established Sasakawa Memorial Health Foundation (SMHF) in Tokyo and these contributions by TNF which amounted to more than US\$300 million over the past 32 years, is likely to continue further, under the current President, Mr. Yohei Sasakawa, who is the WHO's Goodwill Ambassador for Leprosy Elimination, as well as Japanese Government's Goodwill Ambassador for the Human Rights of Leprosy Affected People. This arrangements of utilizing two channels prove to be an excellent set up. WHO has ready and direct contacts with the health authorities of leprosy endemic countries in the world. WHO could advice on or even direct national leprosy control of these countries. However by being a huge international bureaucracy, WHO is bound by many official protocols, past precedents, and its action could be slow and non flexible. SMHF on the other hands, being a newly created small NGO, did not have ready access to the health authorities of a country. But its actions could be both quick and flexible, so that it could meet the existing needs of drugs, equipments, training material and others much more readily country by country. Thus using these two channels TNF's fund has been utilized quite effectively, significantly influencing the global leprosy scene toward the "Leprosy Elimination, as a Public Health Problem". WHO's original goal set by the 44th WHA in 1991 is almost achieved now. Original Contribution to WHO for leprosy was US\$ 1 million a year, however once WHO's recommendation for MDT was published in April 1982, there arouse a necessity for fund to purchase drugs as well as to train field workers, so the TNF's contribution to WHO was increased to US\$ 4 million annually and that level was maintained until recently. Another important contribution was US\$ 50 million over the 5 year period to WHO Drug Fund, so that every leprosy patients could get MDT free of charge from 1995–1999. With expansion of MDT rather slowly in '80s but much more rapidly to cover all existing leprosy cases once 44th WHA Resolutions were put into effect throughout the world, global leprosy scene changed dramatically as we can see now, which could not have been even imagined in '80s when MDT started. SMHF as a NGO has quite a unique policy among leprosy NGOs, to give its support primarily to the national leprosy programme of the central government, and not to have its own programme, and this made SMHF acceptable to leprosy endemic countries as well as to WHO. SMHF from its beginning in 1974, had a strong interest in the Chemotherapy of Leprosy. More specifically on how to stop the dapson resistance spreading rapidly and globally in the '70's. Our workshop held in Manila in January '77 with many global experts, probably the only one before WHO meeting of 1981, came to the conclusion that dapson monotherapy should end, and either rifampicin or clofazimine should be given simultaneously with dapson at least for MB cases. SMHF has been providing large amount of dapson to various countries since 1975, but once WHO's MDT was announced, SMHF started supplying MDT to about 10 countries in early '80 and it expanded to nearly 30 countries by late '80. It also assisted training of field workers on MDT, by financing training sessions of national governments, supplying training materials including the Atlas of Leprosy, providing transport facilities etc. SMHF also financially supported many research activities both in Japan and out. SMHF collaborated with WHO in organizing many international meetings on various subjects, such as epidemiology, immunology etc, and more on global leprosy elimination programs, such meetings in Hanoi, Delhi, Abidjan, Brasilia, Yangon and published some of its transcriptions on IJL or Leprosy Review. Now with Mr. Yohei Sasakawa, TNF as well as SMHF's concern is gradually shifting to the "Social Aspects" as we endeavor toward a "World without Leprosy". Here, Human Rights of leprosy affected person is the basic issue, a difficult problems, because it is not a technical issue solved by experts but involves change of basic attitude of life of all the people in the world.

Achievements of Leprosy Elimination and Future Leprosy Work : Global and National Perspectives : Presentation by Novartis Foundation

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First of all, I wish to thank Dr. Klaus Leisinger and Ms. Vera Haag Arbenz for giving me this opportunity to present Novartis views on achievements and future of leprosy work. I would like to trace back to history of MDT development and its effect on leprosy elimination followed by foundation's involvement in care of leprosy affected persons. To trace the history, Novartis research laboratory developed clofazimine in 1962 for other diseases but found it effective in leprosy. Geigy introduced clofazimine under the trade name Lamprene in 1968. Ciba and Lepetit in Milan developed rifampicin in 1968 under trade name Rimactane by Ciba for the treatment of various bacterial infections. The first result of treatment of leprosy patients with rifampicin were published in 1970. The results of Languillon's trial of once monthly rifampicin were presented by Yawalkar at the international Leprosy Congress in 1978. WHO recommended MDT regimens, published in 1982, were the first to include once monthly supervised administration of 600mg rifampicin. MDT has been the most effective, economical and worldwide accepted therapy for the cure and control of leprosy since 1982. The involvement of the Novartis foundation in leprosy field programs was a natural extension of Novartis tradition in leprosy drug development. Since 1986 foundation supports field programs, in order to understand and overcome the obstacles to improving the access to MDT treatment for leprosy control. Novartis has committed itself to : Provide sufficient quantities of high quality MDT including buffer stocks, to treat and cure all the leprosy patients in the world and provide WHO with the necessary funds for the shipment of MDT and independent quality control. In 1987 Novartis introduced the first MDT blister pack, containing a month's treatment with each day's treatment clearly marked. New packaging was introduced in 2002 brightly colored patient's packs with information in four languages and serve to reinforce patient's confidence in the treatment. Novartis and Novartis foundation joined Global Alliance for Elimination of Leprosy at its creation in November 1999 in the final push to eliminate leprosy. Novartis contribution to GAEL is the MDT donation and country level support. The country level support at Sierra Leone, Indonesia and Democratic Republic of Congo concentrated on fulfilling the prerequisites for the successful introduction of MDT. Later, in 1988, Novartis Foundation developed a social marketing approach for leprosy elimination at Sri Lanka. This involved in large scale advertising campaigns to create the awareness of leprosy and dispel the fear surrounding the disease. This initiative, helped find hidden cases and as a result, leprosy was eliminated at the national level within eight years, by 1996. A scaled down version of the campaign was later adopted by the Mexican authorities. After leprosy was eliminated at a national level, efforts focused on the remaining states. At the global level, the Novartis Foundation collaborates with WHO in the production of information and communication material. At the country level it has supported Brazilian efforts to project a "positive" image for leprosy and a decentralized leprosy services. The foundation has also encouraged patients to come forward for treatment by a special campaign developed in partnership with WHO for Madagascar. At Nepal, the Novartis Foundation supported mobile clinics and subsequently helped to establish the Butwal referral clinics which addressed a pressing need, especially for disability care. From 1990-1996 in Turkey, mobile teams traveled by air and road to bring MDT treatment closer to patients reaching almost 94% of all registered cases in the country. In 2000 the Novartis Foundation helped the Sri-Lankan Ministry of Health develop the blueprint for integration and supported its implementation for five years. Leprosy is now part of the job description of every medical officer in the country and is treated within the general health services. From the very fact that even before the "elimination" (1991) became a buzzword in leprosy field, Novartis Foundation is involved in "caring" for leprosy patients. In 1989, the Foundation set up the comprehensive leprosy care program (CLCP) in India. Its aim is to provide comprehensive care to patients i.e. MDT treatment and disability prevention, correction and care services. CLCP improved the access to MDT at Borsad Taluka and introduced MDT Blister packs at Goa. As a result Borsad reached the redefined goal of elimination and at Goa the prevalence was brought down drastically. However, the most important aspect of CLCP was pioneering the care of the leprosy disabled persons. Over the years, CLCP has established the key modalities which include health education, physiotherapy, splints, self-care kit, MCR footwear and grip-aids as part of Disability Prevention services. Medical rehabilitation is provided with reconstructive surgery as Camp and Workshop Approach and complemented with articles for income generation given free. CLCP approach has been hailed as holistic approach. Many of the disability care modalities have been adopted by the government and NGOs at India and abroad. With an estimated cure of more than 11 million cases with MDT (4.5 million through Novartis donation) and reaching thousands of disabled cases for care, Novartis Foundation is firmly committed to achieve a world free of leprosy.

S-2 : Achievement and Future of Leprosy Work-Technical Perspectives

L-22

Case Detection

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There are many things in leprosy not understood, or ill understood. One of them is case detection trend. For several years intensified leprosy control under vertical programme generated a large number of new cases especially in endemic countries like India. While some countries could achieve elimination as a main consequence of new case reduction while under vertical control others did after integration. India which continues to contribute substantially to global new case load has seen a drastic reduction in new cases especially in the last four years which could be due to one or more operational factors. How to overcome the influence of these factors and ensure quality in case detection is the issue that needs to be addressed.

L-23

Treatment Issues

Laundry Bide

L-24

Integration of Leprosy Care into General Health Services

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Leprosy control programme was one of the successfully implemented disease control programmes on a global scale. The case load was large at the initial phases. Different strategies were defined at the country level depending on the endemicity and country policy. Many leprosy endemic countries resorted to vertical setup as intensive programme activities were planned. Specialised work force was created to implement the activities. As the endemicity lessened an integrated approach was adapted. Health care personnel were trained to take up the task with assistance from remaining specialised workers from vertical setup. Wrong diagnosis was minimal and treatment delivery was good. Accessibility was one of the major advantages with integrated services. Semi vertical system was adapted in some countries as it was not possible for complete integration. It was also demonstrated that other programmes were integrated with leprosy programme where the personnel had expertise in public health approach. Though there are few difficulties - mostly administrative - it was encouraging to observe that primary health care system did perform well in most of the situations. Characteristics of geographical regions differ and challenges still remain.

L-25

Prevention of Disability : Who is Preventing What ?

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The most significant factor in the reduction of leprosy related disability is the early detection and treatment of leprosy so that the disease process can be arrested before the onset of peripheral neuropathy. The prognosis for people who will contract leprosy in the future however, is poor, because concomitant with lower detection rates there is almost certain to be an erosion of the clinical expertise required to detect the disease early or to manage nerve function impairment adequately. A salutary conclusion is that people will continue to develop secondary impairments with associated activity limitations and participation restrictions. A stronger focus on interventions to address such issues is, therefore, a pragmatic imperative. The prevention of secondary and tertiary disabilities is now recognized as a significant concern by the WHO which, in ratifying its revised strategy in 2006, brought the issue of disability prevention and management squarely into the domain of leprosy control. Realities of the disability issue in the changing scenario of leprosy services challenged delegates at the Consensus Development Conference (CDC) on the prevention of disability (POD) in 2006. A consensus was reached that the fundamental POD research theme requiring concerted attention was how to achieve a greatly enhanced global coverage of self-care and footwear requirements. However, foundational research on which these interventions should be developed is scarce. The assessment of footwear is problematic due to the diversity of independent variables that affect outcomes. The issue needs to be addressed because with the lack of alternative evidence, specially made footwear for people with insensible feet due to leprosy is still considered by many to be mandatory. Very few have challenged this concept even though it was a development contemporaneous with Dapsone treatment. Self-care is, and will continue to be, the mainstay of POD where prevention of nerve impairment cannot be realized, but the acceptance and sustained adherence to self-care is subject to a very complex array of health expectations and motivational factors. The Innovative Care for Chronic Conditions (ICCC) is introduced. At the core of the model the impact of chronic conditions is determined by affected individuals who are supported by adequately prepared teams of health workers and also by informed and activated communities. Acceptance of the model requires a radical paradigm shift which will challenge the prevailing "Industrial Age" model of health delivery to which most of the developing world still adheres.

S-3 : POD / RCS / Medical Rehabilitation

L-26

Management of Disabilities in the Field

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The Management of Disabilities in Hansen's disease (HD) is ideally based on the WHO International Classification of Functioning, Disability and Health (WHO, 2001). It is important to routinely measure and monitor body functions and structures, the ability to execute activities and the ability to participate socially within the context of one's own environment. The prevention and early detection of impairments, limitations in ability to do activities and/or restrictions in social participation, should direct planning and execution of POD/Rehabilitation interventions. Changes in impairments, activity limitations and participation restrictions should be regularly monitored and evaluated to indicate if the results of POD/Rehabilitation interventions (self-care, footwear, surgery, etc) have achieved their objective to prevent and/or minimize disability. Disability management is required during MDT and after MDT. Careful attention needs to be given to those persons at highest risk of developing or furthering disability, which includes persons with nerve function impairments, reactions and/or with a WHO Grade of 1 or 2 at diagnosis or after release from treatment (cure). POD/Rehabilitation coverage, the quality of services and the development of the services are dependent on a well organized plan and clear guidelines. Strategies which integrate activities to prevent and control disability within HD control programs begin in the community with basic health care services and extend to include specialty referral health services. The participation and collaboration of all levels of health provision improves POD/Rehabilitation awareness, access and quality of services. Self-care and self-help groups can be a very effective strategy for managing and sustaining disability prevention. Basic POD knowledge and skills training is essential for front-line health workers, persons affected by HD and their families. Training programs need to plan adequate time and opportunity for health workers (doctors, nurses, therapist, etc) to develop their skills to do POD essentials. This ability gives them the confidence to implement, practice, develop and advocate the activities after training. Systematic in-service training during supervision can be an effective way to develop the capacity of the health team, the patient and the family, to prevent and manage disability. The use of patient records (visual acuity, neurological exam, WHO grade, SALSA and Participation scores, etc), after-care registries and Impairment Summary Forms (ISF) are essential for monitoring and evaluating the success of individual patient and program disability management. The local health team can, and should, learn how to monitor and evaluate its own services. However, the greatest challenge to disability management is that most health services have limited time, limited technical and financial support and/or limited opportunities to learn about how to manage documentation, organize services and implement activities, in an effective and efficient manner. It will require the collaboration and coordination of government and non-governmental projects and programs to work together.

L-27

Self - Care Promotion

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Long ago in 1966 Dr. Paul Barnard said there is hope of saving the hand, feet & eye of the leprosy patient only when it is widely recognised, the whole problem is one of mechanics. As we know leprosy patient needs cure of leprosy, Prevention of disability & Rehabilitation. Prevention of disability our goals & aims are no new disability & no worsening extending disability. For that we have to practice more Skin care, Nerve care, Joint care, Wound care, & eye care. Routinely patients should follow seven principles Look, Soak, Scrape, Oil massage, Exercise, Dressing & Protecting. Patients should know the importance of Soaking, Oil massaging & M.C.R. sandel, For all this team work is ideal, Specially the patient is an essential member of the team, We cannot do much unless the patient understands the problem himself.

L-28

Current Concepts in Reconstructive Surgery in Leprosy

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It is estimated that of the 500,000 existing disabled cases nearly 100,000 (20 %) are eligible for reconstructive surgery. Some of these cases require more than one surgery. However, considering the paucity of experienced surgeons, it is necessary to adopt a multi-pronged approach. The specialized institutions and super-specialty departments of the medical institutions have provided their services and have been the apex center for training of surgeons, in simple techniques. Another major concept established recently has been the "Camp & Workshop Approach". Here, a large number of surgeries are carried out, along with practical training being imparted to interested surgeons. However, what needs to be taken into consideration is that this Camp & Workshop Approach is a short term activity. The real integration of reconstructive surgery can only be achieved through the

involvement and support of medical colleges and district institutions. Simple techniques of Reconstructive Surgery need to be adopted by district institutions for medical rehabilitation. Hence, over the years, various techniques and methods for performing reconstructive surgery have been developed. These methods aid any surgeon with basic surgical knowledge to perform reconstructive surgery successfully. Thereby, with due respect to all, I endeavor to present some of these techniques here. Briefly, one in four lasso (Atul Shah, 1986) for correction of claw hand and TRAC operation for transverse arch correction are simple to perform and teach. Also, in majority of cases, a reasonable result is achieved. In other common deformity of plantar ulcers, it has been realized that it is easier to utilize local fascio-cutaneous transposition flap to provide cover with similar tissues rather than complicated myocutaneous flap. Both yield almost similar results in long term. The only exception to simple technique is the neurovascular island pedicle flap from the great toe, for coverage of ulcer on first metatarsal head which though technically difficult, provides a sensate skin and prevents recurrence in majority of the cases. The self-care teachings with self-care kit for healing plantar ulcers have been described with excellent results. Recently I have been working on reviving the technique of plantar skin graft. This simple procedure can be implemented even at a district hospital. Another important deformity in any leprosy case is lagophthalmos. Timely tarsorrhaphy or a temporalis sling has been a standard method for its correction. However, few plastic surgeons and some ENT surgeons prefer gold implant, due to the simplicity of the operation. A very small percentage of cases require saddle nose correction and eyebrow grafting. These operations being those requiring cosmetic correction are better left to experienced surgeons. Finally, whether for cosmetic reasons or restoring function, reconstructive surgery helps to remove stigma, elevates self-esteem, and re-integrates a person in society. At Novartis CLC Association, "we not only support reconstructive surgery but also follow-up the patients, through provision of rehabilitation aids." These aids are made available to those patients, who want to revive their lives, following reconstructive surgery. Hence, it may be said that, *"every single step taken puts a surgeon in charge of rehabilitating individuals rather than merely correcting deformities"*

L-29

Leg and Foot Problems in Leprosy Patients

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There are two important problems involving leg and foot of the leprosy patients: leg ulcers and neuropathic leprosy ulcer. Both related to predilection of *M. leprae* to peripheral nerves^{1,2}, infecting the Schwann cells and consequently initiating a nerve damage in leprosy³. In a sample of 79 leprosy patients, 32% presented cutaneous ulcers and these seemed to be related to disability grade II and to positive bacilli detected by both spectral and operational classifications, and almost 70% of the ulcers were localized in lower extremities, according Guzzo et al⁴.

Considering the leg ulcers in leprosy patients, there is a problem with wound classification, because they present clinical characteristics as a peripheric skin sclerosis, a bottom covered by granulation tissue, and not painful, being classified wrongly as venous or mixed ulcers. Frade et al (2006) observed that approximately 80% of leprosy patients with leg ulcers presented a normal venous duplex scan exam and their ulcers didn't present the distal edema and hyperpigmentation resultant of chronic venous insufficiency (CVI) as showed in Figure 1. Although unknown the real etiologic mechanism, these results showed that the leg ulcer not frequently is consequent of CVI in leprosy patients, needing a specific classification and consequently different treatment and guidelines⁵.

About foot ulcers, related with sensitive and motor neuropathy during the leprosy evolution, there is a consensus that the foot protection is fundamental to prevent ulcers, infections and amputations consequently. The ulcer prophylaxis is possible trough the early neuropathy diagnosis, physiotherapy and appropriated footwear insoles and sandals. During the follow up of leprosy patients their use is difficult and not regular, and it requires exchange every four months. Alterations in foot dynamics due to neuropathy cause frequently abnormal distribution of plantar pressure and results in the formation of the callous and new ulcer, infections and future amputations. To evaluate the modifications of the neuropathy and plantar pressure the dynamic computerized baropodometry offers good results and can help the health professional to implement or modify their cares. The magnetic resonance (MR) is a gold standard to eliminate the risk of osteomyelitis focus. Considering the difficult of use of sandals, the follow up by baropodometry and MR, we present an original pilot case of a leprosy patient with plantar pressure disarrangement treated with nonbiodegradable filling agent (polimethylmetacrylate - PMMA), used commonly to tissue augmentation in HIV patients^{6,7}, applied around the points with high pressure (yellow and red points by baropodometer).

A 53 years-old female white patient, with lepromatous leprosy treated 15 years ago. She presented complete anesthesia plantar bilaterally, superficial callous in distal head of the 1st left metatarsus; paralysis of right posterior tibial nerve with thick callous in distal head of the 1st metatarsus, first toe and between third and fifth right metatarsi, near the surgery scar of fourth metatarsus and toe amputation. By baropodometry there was yellow area in the first right metatarsus and red areas in first left metatarsus and between 3rd and 5th right metatarsi (Fig. 2A). It was applied 1mL of PMMA per point infiltrated by retroinjection through blue

areas around the right pressure points using the three-dimensional baropodometry image, and 1 mL applied linearly in lateral plantar surface as scheme (Fig. 3A,B) with tissue augmentation (Fig. 3C). After two months, the patient presented a redistribution of the plantar pressure points in right foot and modified indirectly the pressure in the not infiltrated left foot as showed by baropodometry without yellow and red areas represented (Fig. 2B). Clinically the patient related more equilibrium in the walking and presented decreased of the callous thickness bilaterally. Now, after 8 months of infiltrations, the pressure distribution maintains and no reaction occurred.

Thus, these reports can offer an opportunity to discuss about leprosy leg ulcer classification and to show the results of PMMA as filler to be able to augment tissue, protecting the pressure points and redistributing the plantar pressure, improving the life quality of the patient.

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L-30

Comprehensive Care of Disabled

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Introduction : The success of MDT has seen fewer new cases detected with disabilities. Proper management of reactions further prevents the deformities in the field areas. However, in any given area today among the cured/RFT cases, there exists a mix of disabled cases. It does not matter whether they were treated with monotherapy, monotherapy/MDT or MDT alone. They are the major sufferers. A conservative estimate puts their number at 0.6 million at India. WHO estimates global case load of disabled as between 1 to 2 million. Therefore, management of nearly a million disabled cases is a challenging task. It requires the implementation of disability prevention, correction and care activities with such tools and techniques, which can be handled in the field area with ease. Novartis Foundation, since 1989 supports Comprehensive Leprosy Care Program at India not only for cure of the disease but also for the comprehensive care of those disabled due to leprosy. In recent years, after integration of leprosy the program also provides comprehensive care to non-leprosy disabled. Besides medical rehabilitation, comprehensive care aims to look after them with income generation aids following reconstruction or rehabilitation thus making comprehensive care a holistic approach. **Key Components of Comprehensive Care of Disabled :** **Health Counseling** Identification of high risk cases particularly in children age group and providing for post-cure surveillance for disability prevention is a part of the comprehensive care. Thus, high risk cases with nerve involvement without manifest deformity, those with anesthesia (WHO disability grade 1) and those with visible deformities (WHO grade 2) are offered the health counseling. Since major group of disabled is those who self-neglect, health education pamphlet to prevent secondary deformities was developed. It has been translated in to many languages. **Physiotherapy** While grade 1 patients can do with health counseling and protective footwear, the grade 2 patients need more disability care services. A simple way is to have two pronged approach. Health workers are trained in teaching "one exercise for each deformity" and at camps NCLCA advocates 'group therapy'. Thus, one can cater to backlog of the disabled and their interaction becomes like a self-help group. **Prefabricated Standardized Hand Splints :** Splints not only prevent worsening of hand deformity but also help in correction of deformity to a certain extent. Splints were pioneered for field area application by the CLCP. Its prefabrication is possible even at village level, its application is simple and results demonstrate its effectiveness. Used as an adjunct to reconstruction, it is a tool for care pre-op as well as post-op. Not only leprosy but also in other conditions like injury to nerves and paralysis the same splints are used thereby not differentiating leprosy disabled. **Grip-aids Kit :** It has been a long time since Modulan® Grip-Aids were developed and advocated by NFSD for leprosy and orthopedic handicaps. NCLCA has continued the search for better alternatives for comprehensive care. It was noted that majority of those in need of grip-aids need it only for help in ADL (activity of daily living). The VR (Velcro-Rubber) Grip-Aid is a prefabricated grip-aid and can be applied in a minute. It facilitates the grip with a crippled hand and enables a patient to eat, drink, comb the hairs or brush the teeth with the "Grip-Aids Kit". They feel instant improvement in their quality of life. **Foot Care :** The research and development in

providing care to patients with disabilities of feet in leprosy and similar locomotor disabilities has been one of the highly appreciated programs of the NCLCA field activities. Importance of tackling the dryness of feet can not be overemphasized. CLCP advocates the self-care with any oil or Vaseline. **Foot Drop Splint** : There are two types of splints. The dynamic foot drop splint pulls the dropped foot in to dorsiflexion at ankle and static splint provide only support to stabilize ankle in neutral position. The former is used while expecting recovery with steroid therapy and as pre or post splint for reconstruction. The later is preferred as life long support when patient refuses operation. **Self-care Kit** : A "Self-care Kit" has been designed and distributed to empower the patients in carrying out domiciliary care by them after they have attended the "Self-care Camp". Excellent results have been obtained by this technique of empowerment and form the guiding principles of participation of people in their own well being. Its acceptance and replication by many has seen it reaching to thousands of cases. **Protective / MCR Footwear** : While those not using the footwear have to be persuaded to use protective footwear, patients with insensitive feet need MCR footwear to prevent injuries and ulcers. To enhance acceptance of MCR footwear by patients, CLCP advocated its making with different commercial designs and lately commercial production. Its research has helped establish priorities for its distribution in field areas. **Reconstructive Surgery** : Reconstructive Surgery (RCS) continues to have an important place in medical rehabilitation. Besides the nominated institutions, we advocate it as integrated activity at all medical colleges. Its important role in surgery on nerves whether for biopsy for confirmation of leprosy or for abscess is undeniable. In order to reach the entire backlog of cases in need of reconstructive surgery, NCLCA advocated the "Camp & Workshop Approach". At Gujarat, it was a major partner and Gujarat example has been hailed as a model. **Economic Rehabilitation** : This aspect forms an important part of the comprehensive care of disabled. 'The knife is not enough' were the words of Sir Henry Kessler, a rehabilitation specialist. Moreover, what good is reconstructive surgery if a patient is not going to use his hands after corrective surgery? Currently, activities for economic rehabilitation are undertaken as either gift in cash or kind, microfinance/loan for occupation or housing and special grants or pensions. NCLCA follows the holistic approach in which patients who are eligible for support benefit by various aids e.g. handcarts, sewing machines, agriculture or carpentry kits etc. The economic rehabilitation program is carried out with participation of local leaders, political personalities and opinion makers to gain wider acceptance of leprosy cases in the society. In conclusion, through Novartis CLC Association, a pragmatic approach has been developed for disability prevention and medical rehabilitation. Simple cost-effective tools have been researched with which it is relatively easy to care for not only leprosy disabled but also those with similar locomotor disability. Thus, combination of scientific and holistic approach as practiced by Novartis Comprehensive Care Program has assured that leprosy is no longer a disease to fear of and has made a qualitative difference in the life of a disabled patient.

S-4 : Epidemiology of Leprosy

L-31

M.leprae in Healthy Individuals and Transmission of Leprosy

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Sources of infection, mode of transmission, patterns of exposure and the early pathogenesis of *M.leprae* infection remain to be elucidated. Our current understanding of transmission is largely based on assumptions and hypotheses rather than on evidence. A series of studies have been conducted notably, in India and Indonesia, using polymerase chain reaction methods to identify the presence of *M.leprae* in the upper respiratory tract of healthy people living in leprosy endemic areas using nasal swabs. The prevalence of PCR positive individuals in communities varied from 1.6% to 7.8%, while a similar study in a non-endemic community failed to find any positive nasal swabs. Follow-up of the individuals tested showed that the PCR positivity was transient and one study showed a marked seasonal variation with most positive swabs being found in the wet seasons over several years. The findings from these studies in different countries indicate that the presence of *M.leprae* in the upper respiratory tract as detected by PCR methods is transient but it is not associated disease frequency, contact status or BCG. However mucosal and serological markers of the immune response in the same studies were found to be associated with disease frequency, contact status and BCG. Chronologically exposure would precede development of an immune response, which is influenced by many other factors such as the nature, and frequency of exposure, presence of co-infections and genetic factors in the immune response. Other bacterial infections such as streptococcus and meningococcus also show transient carriage in the upper respiratory tract that does not appear directly related to disease. The very slow rate of multiplication of *M.leprae*, the long incubation period, the variable host immune response and the very low incidence of disease make it extremely difficult to link exposure to disease. The transient presence of *M.leprae* in the upper respiratory tract in leprosy endemic communities is hard to interpret but may well have relevance to patterns of exposure and transmission.

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Prevalence of leprosy has decreased dramatically in all endemic countries, mainly due to the generalization of the WHO recommended MDT regimens. In most countries, case detection rates of leprosy are decreasing much more slowly, if at all. One reason might be that many leprosy patients are detected relatively late, and transmission of the infection to the surrounding population has already taken place before the index cases are put on treatment. Consequently, interest has risen again during recent years for additional interventions such as chemoprophylaxis. A number of trials had taken place in the past, based on dapsone or acedapsone. More recently, Rifampicin based trials were conducted. Protective power was generally of the order of 40 to 60 %, but it usually waned over time. Another problem is the fact that, as leprosy is a rare disease, the number of people needed to receive prophylaxis in order to prevent one leprosy case is usually unacceptably great, except in carefully selected population groups. Serological test have been developed in order to try and diagnose sub-clinical leprosy infection. Tests based on the PGL-I antigen have shown good sensitivity to detect MB cases. It is however much lower for PB leprosy. Research is still ongoing, aiming at developing new tests with increased sensitivity and specificity, and permitting to identify the persons with a very high risk of developing the disease in the subsequent months or years. This could permit to better target people who could really benefit from a chemoprophylactic intervention. Individual and public health benefit for the use of these tests prior to chemoprophylaxis will be discussed.

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Mycobacterium leprae and human leprosy probably originated in Africa or Asia thousands of years ago, from where it spread over much of the world. After becoming established on all continents and in most large island populations, the disease is known to have declined to disappearance from several wealthy populations, in particular in northern Europe, starting several hundred years ago. The classic example is Norway, where the well documented decline from 1850 to 1950 suggested correlates (eg increasing age at onset and increasing proportion lepromatous) which might be searched for in other populations. Information on numbers of leprosy patients became widely available during the dapsone monotherapy era (c. 1950 – 1981). Recorded trends over that period are confusing as programmes were extending their coverage and data emphasised registered prevalence (numbers of cases on treatment, which was life-long), though most registers had no means to remove cases who died or moved away. The result was a steady increase in reported prevalence, in most populations. The introduction of short course regimens between 1981 and 1995 had a huge impact, reducing global prevalence figures by more than 80 %. This decline was due largely to cleaning of registers (removal of deceased and left individuals) and shortening of treatment duration (from life-long to 12 – 24 months). It was this dramatic decline – in prevalence, but not incidence - which gave confidence to launch the so-called “elimination” programme in 1991. The past decade has brought further confusion over actual trends, due to the elimination initiative’s emphasis upon a “prevalence” target of 1 per 10,000, and major operational changes which influenced reported case numbers: active case detection surveys (LECs) and special action projects (SAPELs) which increased numbers of “new” cases; changes in registration practices which tended in general to reduce numbers of cases; as well as changes in classification as a consequence of which it is no longer possible to trace proportions of tuberculoid/paucibacillary versus lepromatous/multibacillary over time. It has thus not been possible to use the “Norway paradigms” to interpret trends. Leprosy incidence trends are clearly influenced by socio-economic factors, consistent with the observation that leprosy is associated everywhere with poverty. BCG vaccination must have decreased numbers of new cases worldwide in recent decades, though its precise impact is difficult to measure as vaccination was introduced and expanded alongside other control measures. Case finding and treatment must also have reduced infection risk and hence disease risk to some degree, though the extent of this effect is contentious, and there is little convincing evidence of declines in incidence in recent years. It is unfortunate that the success of the global “elimination” programme in reducing the leprosy case burden worldwide, and providing free treatment to all sufferers of the disease, has been tarnished by its having eliminated our ability to monitor what has actually happened to this disease. This problem has been taken into consideration in the current Global Strategy (for Further Reducing the Leprosy Burden and Sustaining Leprosy Control Activities: 2006 – 2010), which recommends a shift away from prevalence targets to an emphasis upon numbers of new cases. Only by consistent reporting of new case numbers will we be able to monitor the actual trends of leprosy over time.

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The WHO often quotes 600 million as an estimate of the prevalence of disability world-wide. However, national statistics on disability vary widely (e.g. Nigeria 0.5%, Norway 33%, 1991), depending on the method used for assessment, the types of disabilities included, the demographic profile of the country, the stigma attached to disability and the disability awareness in a particular population. In many countries, no recent reliable figures are available at all and estimates, if any, are based on small studies done in certain areas. Hardly ever do such estimates include data on activity limitations and participation restrictions, which, according to the International Classification of Functioning, Disabilities and Health, are part of the definition of disability. In a recent major ICF-based random sample survey in Zambia, 11% of nearly 30,000 people surveyed reported disabilities. This figure was just under 5% in a recent survey in South Sulawesi, Indonesia. Information with regard to leprosy is slightly better, in that data on people with visible disabilities have been collected systematically for over two decades. However, these relate only to physical impairments. In addition, no systematic figures are available on the prevalence of disabilities at release from treatment, or, indeed, on the prevalence of leprosy-related disabilities among former patients who are still alive. In 1995, WHO estimated the prevalence of grade 2 impairments to be between 1.4 and 3.4 million. In 2006, the proportion of new cases with grade 2 disability was reported to be 4.7% (or 12,449 out of 265,661 new cases, WHO 2007). The proportion with grade 1 disability is often similar, which would put the total annual incidence in 2006 at ~25,000 (9.4%). This is likely to be an underestimate, even of impairment, since many patients in integrated leprosy programmes do not receive an adequate disability examination. If the impact of stigma, which often causes restrictions in social participation, was taken into account, the disability estimate may be much higher. In a large cohort study in Bangladesh, the incidence rate of new nerve damage was ~1/100 person years at risk (PYAR) among PB and 16/100 PYAR among MB patients in the 5 years following the start of MDT. 93% of episodes occurred during the first two years. However, regional differences in the risk of leprosy reactions and nerve function impairment should be taken into account. This risk appears to be higher in South-East Asia and some African countries (e.g. Ethiopia, PB 11 and MB 25/100 PYAR) than elsewhere. Continued vigilance for the occurrence of reactions and regular nerve function assessment continue to be essential components of quality leprosy control programmes. There is an urgent need for better estimates of the prevalence of disability and for data on actual needs of people with leprosy-related disabilities to inform planning of prevention of disability activities and rehabilitation services. In several countries, data have been or are being collected as part of studies or disability needs surveys. Some recent data obtained in different countries will be presented. **Acknowledgement:** sponsorship was kindly provided by Netherlands Leprosy Relief

S-5 : Reactions & Neuritis

Risk Factors & Clinical Features for Developing Reactions & Neuritis

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Mechanisms of Nerve Damage

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Reactions are caused by delayed type hypersensitivity inflammation and this requires treatment with anti-inflammatory agents. Corticosteroids are the first line of treatment. Practical management points include warning the patients who has been started on treatment about reactions and educating health workers to recognise reactions. Nerve function (NF) monitoring with Semmes-Weinstein monofilaments is important to ensure that early and silent nerve loss is picked up quickly. The current WHO Global Strategy document recommends treating type 1 reactions with steroids for 3-6 months. However only 60% patients will have improved nerve function. The evidence base for improvement with steroid treatment is very weak and a recent Cochrane systematic review of Corticosteroids for treating nerve damage in leprosy identified only three randomised controlled trials (RCT) that met the review criteria.¹ Further RCTs are needed to identify the best treatment regimens. Duration may be more important than dose; a randomised controlled study comparing different steroid regimes showed that patients with TIR who received 20 weeks of prednisolone had better outcomes than patients who received only 12 weeks of prednisolone. The TRIPOD 3 showed that treatment of patients with steroids is not beneficial if their NF impairment has been present for longer than six months.² It is important to establish the role of second line agents in patients who do not respond to prednisolone or who have contra-indications to taking steroids. Azathioprine in combination with a short course of prednisolone was as effective as a 12-week course of prednisolone in the management of TIRs in Nepal.³ Ciclosporin has been used in pilot studies in Nepal, Ethiopia and Brazil with some success.⁴ Two RCTs are in progress, one looking at the potential role of Methyl prednisolone in the treatment of TIR and a large RCT using azathioprine in North India. Silent neuropathy is present when there is asymptomatic nerve function impairment. It is therefore only detected if physicians perform a careful examination of the peripheral nervous system. In Nepal 13% of patients developed SN. The majority of SN was present at diagnosis or developed during the first year of MDT. The treatment of SN is the same as for TIR. Better tools are needed for the assessment and monitoring of leprosy reactions in both the clinic and research setting.

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Introduction : We would not be here today, gathered together in a Leprosy Congress, if leprosy would be only a skin disease with a substantial immunological background. Unfortunately, nerve damage is a major component to leprosy and the resulting disabilities and deformities accounts greatly for the burden of leprosy – fear, rejection, stigma, social and emotional burden. In the last 50 year Clinical treatment has achieved remarkable advances. WHO MDT and other special regimens have contributed for a deep change in the scenario of leprosy epidemiology and, ultimately creating a new face for an old disease. However, prevention and treatment of nerve damage is still not adequate and results are poor. **Prevention :** Prevention of deformities, simple or complex, depends on modification of patient's behavior and, for any disease, this is a challenging task and it would not be different to leprosy. In this sense, and in a very broad way, it could be said that decrease in deformities rate in the last decades is due to early diagnosis and MDT rather than to actual implementation of prevention actions (Figures 1 and 2). However, techniques for preventing damage due to loss of sensation and muscle palsy are important to prevent worsening of disabilities already present and such techniques have an important role to play in the comprehensive treatment of any case of leprosy. In any case, one should remember that investments should be made in the early detection of cases in order to minimize the need for lengthy, difficult and costly rehabilitative measures. However, if present, these conditions should receive detailed attention from health professionals and in a very multidisciplinary approach. In this sense, nerve surgery has been a controversial item that need further and in deep discussion (RICHARD, 2004).

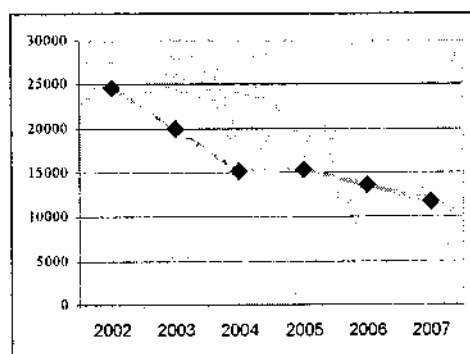


Figure 1 – Reduced prevalence of cases with GD2 among new cases detected worldwide. Source: WHO-W.E.R

Nerve surgery : Surgical intervention on nerves in leprosy is not a novelty. Back in the 30's of the 20th Century there are many reports of operation on nerves in countries such as Brazil and India. Later, Paul Brand and A. Carayon (1969) introduce a new and more technical scope on approaching surgical treatment of damaged nerves in leprosy. Interventions for nerve release started to become a common practice in many leprosy programmes and an array of distinct technique were proposed. Among them it is possible to cite release of fibrous tunnels or ligaments, epineurotomy, inter fascicular release, anterior transposition, epicondilectomy and neurolysis with intra neural injection of long standing steroids. After an initial boom, surgeons started to become more cautious on indication neurolysis. Indeed, results have been poor since the beginning – apart from pain, a symptom that consistently disappeared soon after surgery. A brief review of the literature on this issue reveal that the methodology employed was poor to support any valid result. Most of the studies are retrospective, what by itself is not necessarily faulty, and the studied groups were definitely not homogeneous to draw consistent conclusions. Prospective studies on results of neurolysis are scarce (may be not more than 3 so far) and the follow-up is too short for reliable conclusions. Despite of that, it is a common sense among most clinicians and surgeons that the constriction of the inflamed nerve trunks in leprosy is a reality and that surgical release of this anatomical constriction in selected sites is necessary. In fact, regardless of the innovative findings that dystroglycan, a *M. leprae*-targeted Schwann cell receptor, and its associated molecules in myelination, demyelination and axonal functions suggests that these molecules may have a role in early nerve degeneration (RAMBUKKANA, 2004)), anatomical constriction is a macroscopic event that calls for some major intervention. Therefore, surgery has a role to play in the treatment of leprosy neuritis – what is still to be determined is the extent of this role and the point in time for its effective application.

Indications for surgery : Before more reliable information is obtained of the results of nerve surgery, a careful indication for nerve intervention in selected cases should be the routine. It is also understood that fine technique, use of magnification and qualified surgeons are unavoidable conditions for ethically acceptable interventions (DUERKSEN, 1997). **Nerve abscess :** In presence of nerve abscess surgery should be considered, mainly in those cases of a large swelling fluctuating mass around the nerve trunk. Careful exposure of the cavity should be made and the caseous material removed without harm to the underlying nerve bundles. *Lack of improvement of nerve function with adequate steroids* Presently, all cases of frank neuritis should be treated with enough steroids. If within 3 to 4 weeks there is not a clear improvement in nerve function (sensory/motor), a nerve release is indicated. This indication is controversial and only a controlled randomized trial would launch some light on this issue. However, the common sense favors this sort indication.

Intermittent neuritis : Another indication is those cases in which the use steroids gives relieve of pain and improvement of nerve function but, as the steroid is tapered off, pain recurs and nerve function suddenly worsen. Nerve release seems to give some solution to this sort of intermittent or recurrent neuritis. **Surgical technique :** It not anymore time to believe that leprosy affected persons accept any quality of medical attention. They should have the best available treatment. This is particularly true for nerve surgery. These operations should be performed by experienced surgeons with sound knowledge of the different techniques. The use of magnification and fine instrumental is mandatory if epineurotomy is indicated. Pre-operative clinical preparation is mandatory and ambulatory procedures should be avoided.

The use of specific techniques varies from surgeon to surgeon. However, some points are common to all. Among them, the need for full release of fibrous tunnels, such as the carpal tunnel for median nerve release and the release of acroserocry anatomical structures such as the fibrous margin of the Flexor carpi ulnaris in ulnar nerve release and the fibrous arcade of the Abductor hallucis in the posterior tibial nerve release. In what concern ulnar transposition in the elbow, surgeons now-a-days seems to be more conservative and left it to very clear condition of nerve subluxation. In the same line, epicondilectomy should be avoided due to its invasiveness and secondary complications. It seems that, for the ulnar, the simple release of the ulnar tunnel is enough, besides the advantage to keep its fine and important blood supply. **Conclusion :** After some heroic phase, nerve surgery in leprosy seems to enter a cautiousness phase- this is quite welcome since it is clear that more studies are needed to arrive to concrete conclusions on the real role of nerve surgery in the management of leprosy neuritis. In this sense, controlled and randomized trials, although difficult to conduct, are the choice. Meanwhile, nerve surgery should still be part of the

armamentarium of management of neuritis. In the sake of security for patients, all the limitation and precautions listed above should be taken into consideration. However, a note of reproach should be launched to groups that are systematically trying to bring discredit to nerve surgery as something false and useless. There are some evidences that, in carefully selected cases, reasonable improvement of pain and nerve function can be obtained by carefully conducted nerve surgery – clinical should not deny to these cases this concrete possibility.

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S-6 : Chemotherapy & Drugs Resistance

L-39

An Overview of WHO Regimens for Treatment of Leprosy

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The leprosy elimination programmes all over the world have been based on the application of multi drug treatment (MDT) based on WHO recommended regimens. These regimens are based on three drugs rifampicin, clofazimine and dapsone. While all of these three drugs have continued to be core drugs during the last 25 years, there have been changes in the classification of the cases for treating and appropriate paucibacillary or multibacillary regimens and also in deciding the duration of treatment. The duration of MB regimen has changed from end point of initially bacteriological negativity to two years and ultimately one year which is currently being used all over the world . While this reduction to one year was not initially acceptable to some investigators without proper trials, no increase in relapsed rates has been reported and results have been generally satisfactory. This may be possible due to decrease in their number of bacteriologically positive cases specially more than 3+ BI or the follow up in the recent years and monitoring might have missed some cases. The WHO regimen of 6 months for PB leprosy has shown good results in most parts of the world and continues to be acceptable. Alternative regimens have been recommended for cases having intolerance to one or other drugs of the current antileprosy regimens. These basically include drugs like minocycline and ofloxacin. As clofazimine reduces the reactions and also activity in both MB and PB leprosy, common regimen like uniform MDT has been proposed and is undergoing clinical trials. While the overall results with WHO regimens have been good and acceptable in terms of low relapsed rates and prevention of emergence of drug resistance, the search for combinations/regimens to reduce the duration of therapy further continues. It would be important to have proper surveillance programmes to monitor these parameters in a meticulous manner so as to undertake improvements wherever necessary.

L-40

Newer Drugs and Possible New Generation Multi-Drug Regimens for Leprosy

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1. The needs of new regimens which are more effective and operationally less demanding may be summarized as follows.
 - i. Administration of the daily component of current MDT regimen is not supervised, thus the regimen for MB leprosy is not rifampicin (RIF) resistance-proof.
 - ii. The duration of treatment for MB leprosy is still too long. Because dapsone (DDS) and clofazimine (CLO) are weak bactericidal against *M. leprae*, it is highly unlikely to further shorten significantly the duration of treatment without dramatically modifying the composition of the current regimen.
 - iii. Some patients with RIF-resistant leprosy or even multidrug-resistant leprosy have already been identified, and the World Health Organization is planning to create an international network to map the distribution and to determine the magnitude of RIF-resistant leprosy. As part of the strategy to manage the emergence of RIF-resistant leprosy, naturally, a safe and

effective alternative regimen should be developed for those patients with RIF-resistant leprosy or who cannot tolerate RIF treatment.

In brief, two different new regimen should be developed: one is to simplify the treatment and facilitate the supervision of drug administration, the other is to treat RIF-resistant leprosy or patients who cannot tolerate RIF. Whatever the objective, the major advance is going to be achieved by introducing new antimicrobial agents with very promising bactericidal activity against *M. leprae* into the new regimen.

2. Newer drugs: Since the introduction of the current MDT regimens, as shown in the Table, a number of antimicrobial agents with various degrees of bactericidal activity against *M. leprae* were identified. The unit costs of these newer drugs are, in general, expensive; it would be prohibitively expensive if they are administered on daily basis, but the costs could be manageable if they are administered once monthly.

3. Possible compositions of the new generation MDT regimens for MB leprosy:

- i. For the regimen aiming to simplify the treatment and facilitate supervision of drug administration, the following combination is proposed, and the dosages are for adults:

RFP 900 mg (or, RIF 600 mg) – moxifloxacin (MXF) 400 mg – clarithromycin (CLR) 1000 mg [or, minocycline (MIN) 200 mg], once-monthly under supervision. Due to the inclusion of MXF as the second component, the proposed regimen is likely to be more bactericidal than the current MDT regimen for MB leprosy, but the proposed regimen is probably not powerful enough to render its duration of treatment significantly shorter than that of the current MDT regimen for MB leprosy. Therefore, for the time being, the proposed regimen should be administered for 12 months for MB leprosy.

- ii. For the regimen targeting patients with RIF-resistant leprosy or who cannot tolerate rifamycin derivatives, the choice of composition is rather limited. Because the regimen always consists of several less effective and ill-tolerated drugs, and will be administered daily during the initial 6-month intensive phase, the treatment is less efficacy, often associated with adverse effects, and rather expensive. The proposed regimen consists of two phases, *i.e.*, an initial 6-month intensive phase, followed by an additional 18-month continuation phase, as the following:

Intensive phase: MXF 400 mg - CLO 50 mg - CLR 500 mg - MIN 100 mg, daily for 6 months;

Continuation phase: MXF 400 mg - CLR 1000 mg - MIN 200 mg, once monthly for an additional 18 months. Every dose of treatment, either daily or monthly, should be administered under supervision. For patients who had not been treated with longer duration (*i.e.*, more than one year) of DDS monotherapy previously, either CLR or MIN may be replaced by DDS during the initial 6-month intensive phase.

4. Clinical trials: The two proposed new regimens are designed mainly based on the results of mouse experiments or on short-term clinical trials in which the tested compound was often administered as monotherapy. Therefore, it is premature to apply either regimen in the routine programmes until its efficacy and safety are firmly established in carefully conducted clinical trials among patients with MB leprosy. Because the new regimens include some ill-tolerated components, as the first step, the clinical trials should begin with evaluation of the side effects in a small number of human subjects, either healthy volunteers or leprosy patients. If the tested subjects are patients with previously untreated MB leprosy, the preliminary trial may also provide early evidence of effectiveness (*e.g.*, clinical and histopathological improvement, evolution of the bacterial index and viability of *M. leprae*) of the regimens for treatment of MB leprosy. Once the preliminary clinical trials demonstrate that the simplified regimen (*i.e.*, the regimen for patients supposed to be RIF-susceptible MB leprosy and is administered once-monthly for 12 months) is reasonably well tolerated by human subjects and showing early evidence of effectiveness for treating MB leprosy, then should enter the second step of clinical trials, *i.e.*, controlled clinical study. The objectives of the controlled clinical study are to confirm that the new regimen is effective for MB leprosy, and to prove that its sterilizing activity against *M. leprae* is at least as effective as the current MDT regimen for MB leprosy. In the controlled clinical study, multiple regimens, including the current MDT regimen as positive control, are compared. Unlike tuberculosis, there is no surrogate marker of sterilizing activity in leprosy treatment, the gold standard in assessing the sterilizing activity or long-term efficacy of treatment is to determine the relapse rate of MB leprosy after completion of treatment. Because MB relapse rate may be relatively low among patients treated with current MDT regimens (unless among patients with high initial BI, *i.e.* average BI $\geq 4+$) and relapse occurs late (in average, at least 5 ± 2 years after completion of treatment), each arm of the trial requires at least several hundreds of MB patients, and will be followed-up at least 7 years after completion of treatment. Consequently, the controlled clinical study is bound to be long-term, has to be conducted simultaneously in multiple centres, and relatively expensive. With respect to the new regimen for patients supposed to be RIF-resistant leprosy, its long-term efficacy is neither feasible nor ethical to be tested in controlled clinical study among patients with previously untreated MB leprosy. Its efficacy should only be evaluated among patients with proven RIF-resistant leprosy.

Table. List of newer drugs with various bactericidal activities against *M. leprae*

Drug	Class	Bactericidal activity in mice*	Bactericidal activity in human*	Unit cost
Pefloxacin	Fluroquinolone	++	++	Moderate
Ofloxacin		++	++	Moderate
Moxifloxacin		+++	+++	High
Clarithromycin	Macrolide	++	++	Moderate
Minocycline	Tetracycline	++	++	Moderate
Rifapentine	Rifamycin	+++	Not done	High
R207910	Diarylquinoline	+++	Not done	Not commercially available
Linezolid	Oxazolidinone	+	Not done	High

* Based on the activity of (+) for dapsone and (+++) for rifampicin.

L-41

Laboratory Aspects of Drug Resistance in Leprosy

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The determination of drug resistance in leprosy has been difficult due to non-cultivability of *Mycobacterium leprae* in any accepted *in-vitro* medium system. Mouse foot Pad (MFP) the acceptable tool to detect and determine the levels of resistance. The scenario has undergone many changes during the last 25 years. In 1970s and early 1980s, there was increase in drug resistance to sulphones and also some cases were reported to resistant to other drugs. WHO led multi drug campaign all over the world have produced a sea change in the situation. Overall the prevalence of the disease has decreased but qualitatively the proportion of the bacillated cases has also decreased. This leads to a reduction in the utility, usefulness of MFP to detect and monitor drug resistance. Institutes that have proper capability and infrastructure for MFP work have also decreased in number. Considering this situation, one has to debate and decide about the utility of other techniques which could be used to undertake the drug susceptibility test. Over the years, several alternative methods based on phenotypic and genotypic markers have been described for determination of viability and drug susceptibility testing. These include growing *M. leprae* in macrophages and/or in media system showing limited growth and use various markers like enzymes, ATP, isotope uptakes, change in the receptors etc to detect viable bacilli. All these methods require certain minimum bacillary numbers and again will have a limited usefulness in the current scenario when the proportion of multibacillary cases has become lesser. In the present situation, molecular methods for direct detection of mutations in the genes responsible for resistance like *rpoB* for rifampicin, *folP* for dapsone *gyrA* for quinolones will have a greater scope of application. It is important to debate the current experience of use of various methods for drug susceptibility testing which will be important mostly for surveillance rather than patient care in the near future.

L-42

Molecular Biological Techniques for Detecting Drug Resistance

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Implementation of multidrug therapy (MDT) in leprosy control markedly decreased the prevalence of the disease in the world during the last two decades as expected, but isolates with resistance to one or more antibiotics have been detected in some areas. Susceptibility to drugs has been examined by mouse foot pad methods since 1960s, however, molecular biological methods for detecting drug resistance to key drugs, such as dapsone, rifampicin and ofloxacin, have been developed and implemented over last two decades. Dapsone targets dihydropteroate synthase (DHPS) encoded by *folP1* and inhibits folic acid biosynthesis by acting as a competitive inhibitor of *p*-aminobenzoic acid (PABA). The target for rifampicin is the beta-subunit of the RNA polymerase which is encoded by *ropB*. Rifampin mediates its effect through inhibition of transcription. Ofloxacin inhibits DNA replication by binding to A-subunits (GyrA) of the DNA gyrase, a type II topoisomerase. The nucleotide sequence mutations conferring resistance are located at specific sites in the respective genes and are primarily point mutations. Resultant

amino acid substitutions result in resistance by affecting binding sites for these drugs. PCR-direct DNA sequencing has been the most definitive assay for mutation detection because it identifies specific nucleotide changes within a particular drug resistance determining region (DRDR). Samples collected by the slit skin smear or biopsy are applicable for this assay and can be preserved in 70% ethanol at room temperature until template DNA is prepared for analysis. All intermediate- and high-level dapsone-resistant mutants, rifampicin-resistant mutants and ofloxacin-resistant mutants harbor mutations in their respective DRDR. The prevalence of clofazimine resistance in *M. leprae* is negligible and resistance to minocycline in leprosy has not been reported. Accordingly, mutation detection at the molecular level is feasible for monitoring drug resistance in leprosy and could become practicable for field laboratories with simplification of monitoring tools.



Chemoprophylaxis in the Prevention of Leprosy

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In recent years a number of field trials have been carried out to assess the efficacy of rifampicin chemoprophylaxis for the prevention of leprosy in contacts of leprosy patients. Results from these trials are now being analysed and published. A meta-analysis of previous trials with dapsone [1] and the initial results of studies with rifampicin show that there may be a role for chemoprophylaxis in the prevention of leprosy. In a study in Indonesia blanket treatment with a double dose of rifampicin showed a protective effect of 75% after nearly three years of follow-up [2]. This effect had waned after 6 years follow-up (Bakker *et al.*, manuscript in preparation). In a large double-blind, placebo-controlled field trial in Bangladesh with a single dose of rifampicin a protective effect of 56% was observed after 2 years (Moet *et al.*, manuscript accepted for publication). Initial results of a double-blind randomized controlled trials in India show that after 4-5 years follow-up prophylaxis with a single dose of rifampicin gave a risk reduction of 74% (Declercq, unpublished results). The main limitation found in the first two studies was that chemoprophylaxis with the regimens used was most effective in the groups living further away from the patients. During an expert workshop that was held in December 2006 the results available to date were discussed. The following conclusions and recommendations were formulated [3]:

1. Contacts should be screened by a health worker for leprosy and TB prior to the provision of chemoprophylaxis.
2. Chemoprophylaxis should be provided under direct observation.
3. A system for recording and reporting of prophylaxis distribution should be in place.
4. Health workers need to be informed of such a policy and those directly involved need to be trained in selection and distribution.
5. People receiving chemoprophylaxis should receive proper information about its effects so as to leave them with realistic expectations.
6. A system for antibiotic resistance monitoring should be in place.
7. There is a need for discussion and approval of any such programme with the TB (and other infectious disease) authorities. Some of these requirements are not normally met in leprosy control programmes. For others, practical solutions need to be found. Therefore, before chemoprophylaxis can be implemented in such programmes, careful operational and/or health systems research should be carried out to determine the programme conditions required, and to develop practical guidelines for a successful implementation of a chemoprophylaxis policy. Finally, a number of critical issues need further investigation. Practical diagnostic tools are necessary to detect sub-clinical leprosy, and prophylactic regimens are needed for the highest risk groups.

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S-7 : Human Rights

Women's Issues

L-44

Natalie Marcal

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The Right to Family

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I was diagnosed as having Hansen's disease at the age of 14. Following my diagnosis, I was segregated from my family and community and was sent to a sanatorium where it was expected that I would spend the rest of my life. After I was taken to the sanatorium, both my house and school were disinfected. My family went through unbearable and unthinkable suffering. I had to take up a false name when I entered the sanatorium. At that time, sanatoria in Japan were certainly not places for treatment and all the work there was done by the patients. I could not get used to my life without privacy and so missed my home and my family. Marriage between patients was allowed on one condition – the man had to get a vasectomy. If a woman got pregnant, she was forced to have an abortion. I myself got pregnant. A doctor urged me to have an abortion. With no freedom and no money, I had no choice but to follow his advice. The number of unborn babies of people living in Japanese sanatoria exceeds 3,000, and recently some of those fetuses were found, preserved in formalin in the corner of a warehouse. The government finally acknowledged its responsibility for what had happened, and buried them in 2006. I left my sanatorium 40 years ago. My life has been very challenging — one problem after another. I worked for a company for 30 years after I left the sanatorium and had to struggle with all sorts of discrimination. However, that 30 years was not a waste. It has given me the strength and confidence to live. I had the opportunity to attend the International Women's Conference in Seneca Falls, NY in 2002. The IDEA-hosted conference was wonderful. There, I learned that hospital staff and doctors have helped and supported women in other countries so that some work as counsellors and nurses. They have a place in society, and some have children. Many people said they were very happy. The word "happy" echoed in my mind for a very long time. That was when I realised the misery of those of us in Japan. People with family, no matter how poor they are, are very lucky. Those of you who have family need to know that you are very lucky and you should be happy for this. I had six brothers. All of them except one younger brother have now passed away. I saw my younger brother a short while ago. It took me more than 50 years to finally get to see him. Just as if we had opened a time capsule, our childhood memories came rushing back. I have never had the chance to have my own family. This is something that cannot be allowed to happen to anyone again. I am doing all I can so that the same tragedy will never happen to another person. Let us all work together for this.

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Addressing Human Rights Violations in Nigeria

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In Nigeria, people affected by leprosy have encountered a lot of stigma and discrimination in the past. We suffered psychological and even physical abuse, to the extent that some of us were killed or burned alive. Those that were lucky to have their lives spared were either forced to be separated from their families and taken to leprosy settlements or taken to an isolated area in the jungle. Among the problems we faced were the following: Nobody wanted to associate with us, sell to us, buy from us, or marry us. Our children were not admitted to public school. We were discriminated against in hospitals and employment. The discrimination even extended to places of worship. This discrimination has resulted in a high level of illiteracy among people affected by leprosy and many have no alternative way of earning a living but through begging. In 2003, we launched IDEA Nigeria and from its inception, we have been able to unite the people under one umbrella in order to face the challenges ahead. We have visited all the States and our fundamental purpose has been to educate our people to understand that we are human beings like every other human being and that our role in society is vital. At the same time, we want to create avenues to promote self-reliance in order to eliminate begging and enable our children to go to school. With the help of IDEA, things in Nigeria have changed considerably and there is great reduction in stigma and discrimination. However, we still face discrimination, even by the Joint Association of Persons With Disabilities. In 2004, the Federal Government called for a meeting of this Association but excluded people affected by leprosy from the program. However, through our determined effort, we were recognized, admitted to the meeting and I was even elected as the chief Whip of the Joint Association of People With Disabilities. Earlier this year, one chapter of The National Association of the Blind wrote a petition objecting to the inclusion of people affected by leprosy as part of the national body of the Association. We argued against the petition and have kept our position in the Association. In the past, one of our members, Bello Jibril was denied his dream of going on a pilgrimage and IDEA addressed this discrimination. We

have also advocated against people obtaining divorces on the grounds of leprosy. IDEA Nigeria has also asked and succeeded in receiving recognition and assistance from the Government in many ways and many members of IDEA are employed in different government departments. Our children now get admitted into public schools, people accept us amongst them, we attend social gatherings, eat with them, drink with them, etc. These things have become possible because of selfless service rendered by our members day and night till the government listened to us. Through IDEA, we now have one voice that can speak on behalf of others, represent us in government programs and assist our members psychologically and financially.

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Ensuring Human Rights Through Legislation

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Hansen's Disease has a particular stigma and the label of Hansen's Disease always follows a person even if they are completely cured. People with other diseases can freely return to their homes without any restriction, but often this is not the case for those who have had Hansen's Disease. I was diagnosed with Hansen's Disease in 1968 and immediately hospitalized at the National Sorok Island Hospital. After two years I was discharged from the hospital. However, I still cannot overcome the high and thick walls of stigma, even though I was completely cured medically of this disease 40 years ago. The forced segregation law for people affected by Hansen's Disease was abolished in Korea on February 9, 1961. In reality, there were no hospitals to admit Hansen's Disease patients any more. That is why they ended forced segregation for people affected by Hansen's Disease. The Korean Government left them out in the cold to face the cruel social stigma. They could not go back to their home and community as before. They had no opportunity for further education and no adequate jobs were available for them. The only way to survive was wandering and begging for food. The Korean Government's solution was to forcefully capture the persons affected by Hansen's Disease who were begging on the streets in the name of a social clean-up program. They were forcibly sent to the hospital again and cured people were locked in a vicious circle. Their human rights were violated as they were imprisoned, abused and sterilized. They had to endure a harsher loneliness and were more bereft of hope than ever before. And, the stigma keeps being passed on to the second and following generations, even if it has nothing to do with them. The successful resettlement village program, developed by the people themselves, is, unfortunately, not a complete answer in terms of achieving human dignity. Most people will pass from this world without ever saying they had Hansen's Disease. This is a dereliction and omission of our duty. Therefore, we began a strong effort to regain our status as human beings with dignity. As a result, the Korean Government and the Korean National Assembly finally passed a legislative bill for persons affected by Hansen's Disease on September 20, 2007. The reason for this bill is to apologize for the Korean Government's systematic wrongdoing in their care of persons affected by Hansen's Disease and to compensate for the great human losses. The law also examines and explains the truth regarding the violation of human rights and finally looks at how to prevent a repetition of similar incidents in the future. The law was promulgated by President of the Republic of Korea October 17, 2007 and will become operation after October 2008. Those affected by Hansen's Disease in Korea are buoyant with great expectations that this law will restore respect and recognize our equality as citizens.

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Legal Issues and Advocacy

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Introduction of Nepal : Nepal is between two massive country India and China, where 2,50,00,000 of people are living. Between two countries its area is 467 Sq. Km. in rectangular shape. In the northern part of Nepal Mount Everest is standing as the rooftop of the world. **Present pictures of leprosy in Nepal :** As the National data at the beginning of 2007 from Leprosy Control Division, more than 1,00,000 people are cured of leprosy and national data shows that there are 4,670 cases. In Nepal prevalence rate of leprosy is 1.45 per 10,000 people. Where there are 2.45 percent of total cases have deformity. **Situation of leprosy in Nepal :** Mainly in remote area of Nepal people who are affected by leprosy are out of care from their family and society. Main serious problem of this area are hidden cases. Because of social stigma and discrimination people who gets leprosy hide their disease. They know that they have to face many difficulties, if society knows that they are affected persons. Here are some difficulties which leprosy affected people have to face in their life, as follows :

1. Affected People are denied to access to temple.
2. Affected people are denied to participate in social and religious functions.
3. People of society separate them; they are not allowed to stay in their community.
4. Affected people find difficulty in possessing in family property.
5. If the affected is female the misery multiplied by many folds.

Why leprosy affected people are increasing day by day ? Leprosy affected people are increasing day by day because of traditional thinking. In Nepali language leprosy is called "KUSTHA ROG". People who are affected by leprosy are called "KUSTHA ROGI". Not only illiterate people but people who are

well educated they too are suffering from traditional thinking. Even, those dictionary writer defines Leprosy is incurable disease. They define **"KUSTHA ROG"** as **"MAHAROG"** which means non-curable disease and their dictionary defines leprosy-affected people as **"MAHAROGI"** which means people who carry non-curable diseases. Although those well-educated people and dictionary writer know that leprosy is curable but they too wants to be separate from leprosy-affected people. They think that this kind of disease is caused by the curse of God. ..." They know medicine is freely distributed in all health centers and it is freely cured in different hospitals. Besides taking them there, they behave those affected people as second-class level or like as animals. They send them to jungle where they survive their life in cave. In this period they don't support them but usually they say that *"...You MAHAROGI! You did many sins in former birth and now you are getting undergo pain in this birth...."* They laugh on them and say, *"...this is a sweet gift from God... you have to survive on it!* Leprosy, Madness, Tuberculoses, Asthma, Diabetes, Stone, Problem in stomach and syphilis (Sexual Transmitted Disease) are mentioned in the Dictionary, Health textbooks, Law books and Scriptures as non-curable disease, although **Leprosy** is curable.

Not only in Nepal but in India too leprosy is defined as non-curable disease. People of India and Nepal used to say leprosy is **"MAHAROG"**. Even, the 2nd edition of medical dictionary, which is published in India, is effortless for the definition of leprosy, that it is curable or non-curable disease. By this way in this 21st century too national and international dictionary defines leprosy as **"MAHAROG."** Is this fare for them? I want to give advice to well educated people from all over the world... **please don't give any synonyms to Leprosy affected people. They too are the human beings. I want to ask you a question what will you want if you are leprosy affected...** Legal position for leprosy affected people : From the 11th edition's book of law of Nepal's Law code of the land (Muluki Ain) 2058 B.S. describes that if the men or women who are married are affected by leprosy they can be divorced. This is the special gift from the law of Nepal. We all know that if leprosy is not cure in time they will have deformity case. It means they can loose their any part of their body. And they will be disabling person. In the book of law of Nepal's disable protestation Act 2051 B.S. do not response any kind of facility to those leprosy-affected people who are disable. The government of Nepal and Nepalese law did this kind of difference. Equality for leprosy affected people as other people : The word **'equality'** is a noun which bears the meaning , "the state of being equal, esp. in status, right etc." The meaning of equality is defined in Black's Law dictionary is "the condition of possessing substantially the same rights, privileges and immunities and being liable to substantially the same duties." By this definition we can gene knowledge that the whole scenario of this world at present is surrounded by the equality concept, but if we research in the field of leprosy, most of the leprosy-affected people are surviving in the wire of poverty and social heritage. Book of law of Nepal's Law code of the land (Muluki Ain) 2058 B.S. part poor and poverty describes in act no. 7 & 8 that if some body is affected by leprosy, he or she must be transferred there where Central District officer will refer them. In this situation they will loose their family and all the basic needs. Is this can be majored in equal ratio as other people who are not affected by leprosy ? Exploitation of Human rights for Leprosy affected people : When people born in this world they have rights for food, clothes, shelter, education and health. Most of the Leprosy affected people are out of their basic human needs like food, clothes and shelter. People from their society don't let them to stay with them and with their family too. People who are well educated they have only the theoretically knowledge. They don't show their human feelings in their practical life. Following topics are written in the constitution of Nepal 2063 B.S. as fundamental rights but those rights are only tales for leprosy affected for leprosy affected people.

1. Right to Equality 2. Right to Freedom 3. Press and Population right 4. Right to information 5. Right to property 6. Cultural & Educational Right 7. Right to religion 8. Right to against exploitation 9. Right against exile 10. Right to privacy. 11. Right to Constitutional remedy. Work for leprosy affected people in Nepal : Me and Mr. Shovakhar Kandel, Administrative Officer of the Leprosy Mission Nepal discussed why is Leprosy not eradicate in this 21st century and we found the solution that its main cause is definition of Leprosy in Dictionary. The constitution of Nepal also provides chance to divorce between Husband and Wife if any one is effected by leprosy between them. It is stated in a part of a law palace of marriage, in a section of law No. 4,5. All religious and rituals say that only the blessing of God can cure Leprosy. By this reason Leprosy affected person are out of care with Medicine and other equipment. Mr. Kandel and I remain unfair and make opponent of Government of Nepal, Prime minister and office of council of minister, ministry of Health, Leprosy eradication council, all Dictionary writer and publisher of Nepal like Nepal Pragya Prathisthan , Publisher Chakrapani Chalise Memorial Committee, Ratna Puatak Bhandar etc. and resistered a case in a supreme court from two year ago, saying that the definition of the Leprosy must be change. The definition must be this; Leprosy is a general disease, which can be cured by using medicine. And now here we are attending this case and try to change the definition of Leprosy till now. I promised to Ms. Mary 'O' Friel if there is not any technical problem in the judgment of this case, it will be finalized on 18th June 2007. I will surely attend this meeting with a dictionary having changed definition of Leprosy according the order of Supreme Court. I hoped we will win the case because we were in the strong side of this case, the definition of the Leprosy will be change according to the order of Supreme Court, dictionary will define it as a general disease, and society will run in the order of law, but due to the technical problem the final judgment of Supreme Court is moved on 5th of March. If we win in this case violation of Law is punishable act, so society cannot discriminate leprosy patient. Therefore, we are being ready and have hope of success. Nepal will be the first country to change the definition of the word Leprosy from dictionary according to the order of court and the whole world must change its definition. The whole world must define leprosy by this way, Leprosy is a general disease and affected persons are not second-class level people of the society. The main functions of the law are to be punishing the people who will discriminate the people affected by Leprosy. I am very much thankful with IDEA Nepal, who is contributing me in every step of this case. In my coordination last year IDEA Nepal conducted one-day legal literacy program in Kathmandu valley with the help

of Lalitpur Bar Association like this way we are planning to have same program in all 75 Districts of Nepal with the help of Nepal Bar Association. However, here is an economical problem to conduct those programs. Social discrimination to Leprosy affected people is a crime and that is punishable act. This is the main agenda to put forward in this meeting. For the complete cure of stigma, Medicine and equipment are not sufficient but change the thinking of people is the most, so human rights of Leprosy affected people will be protect fully and they should not be socially discriminated. Taking this main theme, we all people who are working in this holy job have to as our visions for leprosy affected People. Lastly, IDEA Nepal is getting and will get full support in this case and we hope again IDEA International will support us fully and will collect the moral International support for this case. I hope the whole world will think their duty to change the definition of Leprosy from the dictionary and discriminate law from the world as we are doing in Nepal.

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Leprosy and Human Rights : A Global Perspective

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Article 25 of the Universal declaration of Human Rights of 1948 starts by asserting, "Everyone has the right to a standard of living adequate for the health and well being of himself and his family including food, clothing, housing and medical care and necessary social services." The UN Convention on the Rights of People with Disabilities was adopted in December 2006 and will be an extremely useful tool for people with leprosy-related disabilities. But the human rights that pertain to people affected by leprosy should not be seen as relating *only to health or disability*. People affected by leprosy have the same human rights as all people. And yet millions of people affected by leprosy, including their families, continue to experience stigma and discrimination. It is perhaps most appropriate therefore, to focus attention on the basic human rights proclaimed in the International Covenant on Economic, Social and Cultural Rights adopted by the UN in 1966. Specific practical strategies are needed to promote the obligations of States to respect, protect, fulfil and promote the rights enshrined in this Covenant and other appropriate conventions. Some of these strategies might usefully include : *Better use of the media and language* – The media in all its forms is still not used enough to promote and reinforce *positive* attitudes. Indeed, in many instances it can still be found guilty of perpetuating negative and disempowering attitudes. Vigilance and persistence are required to promote more inclusive terminology and appropriate language. Much has been done already in the case of HIV/AIDS so why not in leprosy? We need to lose the unacceptable and stigmatising labels. *Legislative reform* – Attitudinal change often comes about only when society has been forced by law to respect certain basic human rights. In the case of leprosy, collation of data on existing legislation, both good and bad, might give a focus for future campaigns for change. In theory, rights and justice are reflected in laws and conventions but the most enlightened of these are worthless unless in practice they are reflected in the way we relate to each other. Human life finds its meaning in relationships. *Working Together* – Traditionally, those affected by leprosy were isolated, ostracised and segregated. People who are marginalized, disabled or oppressed, including those affected by leprosy, need to engage more broadly with each other in order to promote the rights of *all*. Initiatives focusing only on the human rights of those affected by leprosy will risk failure and their advocates will themselves continue to be marginalized and excluded from the development process unless a more inclusive and universal rights-based approach is taken. Such strategies are geared towards making rights-based development more inclusive and require us all to act locally in our own contexts but also globally in the wider context of human rights for all.

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Early Human Rights Advocates – The Voices of Humanity

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In 1892, Frans Jacobs, who was isolated on Robben Island in South Africa due to leprosy, wrote to Queen Victoria: "We write to our revered Queen Victoria . . . oh let us hope that we shall be made free. Let us go to our families. We live as if we were dead on this Island . . . help us and support us as our Ruler. It is so dark here . . ." That same year, Kaluaikoolau, a young man in Hawaii who had been diagnosed with leprosy, resisted being sent to the remote Kalaupapa peninsula because his wife was not allowed to accompany him. His wife later recalled his words: "I am denied the helping hand of my wife, and the cord of my love for her is to be cut, and I am commanded to break my sacred promise before God and live alone in a strange land; the power of man has severed the blameless ones whom the power of God has joined as one." Frans Jacobs and Koolau lived on opposite sides of the world more than 100 years ago and represent two of the earliest human rights advocates in the history of leprosy. There have been many others who stood up against oppression and injustice, often alone. Throughout history, people affected by leprosy have worked to regain their rights and the rights of others. In addition, poetry, books, music, and artwork reveal a legacy of creative expression that represents a form of non-violent resistance to the laws, practices and attitudes that sought to crush identity and the human spirit. As the discussion of leprosy and human rights becomes more widespread throughout the world, it is essential that we remember and acknowledge the early human rights advocates who had leprosy themselves and paved the way for our current efforts. Acknowledging contributions and affording people their rightful place in history is a crucial component of getting rid of the stigma. In addition, the words of those who stood up as powerful voices of humanity, are as relevant today as they were 20, 50, and even 100 years ago.

S-8 : Operational Issues in Leprosy Including Management of Patients

L-51

Drug Supply Logistics and Management

Denis Daumerie

L-52

Case Definition and Detection

Kawuma

L-53

Campaign Approach to Leprosy Detection

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Introduction : Leprosy is being eliminated as a public health problem at national level throughout the world. Campaign approach was used during two periods: dapsone monotherapy and multiple drug therapy eras. **Campaign approach in Dapsone era :** From early 1950s to late 1970s, leprosy control was mainly carried out through vertical programmes with specialised health staff running all activities from Central to Peripheral levels. Mass campaigns for case detection and treatment were organised with "mobile teams" comprising medical doctors, paramedical staff and lab technicians. Dapsone era campaigns were highly effective in reducing leprosy burden. **Campaign approach in MDT era :** Campaign approach for leprosy detection was used during so-called LECs (Leprosy Elimination Campaigns), SAPELs (Special Action Projects for leprosy Elimination), SML (Social Mobilisation campaigns for Leprosy) and Leprosy Days or Health Education Campaigns (HEC). These interventions combined IEC, Active case finding and Case management with MDT. They allowed to diagnose and cured millions of cases of leprosy, accelerating the achievement of leprosy elimination as a public health problem. **Conclusion :** With the support of the WHO and ILEP member NGOs, the remaining 4 endemic countries should achieve leprosy elimination as a public health problem by the end of 2010. Implementation of the strategy for further reducing the burden of leprosy should lead other countries to durably reach a detection rate less than 1 case per 100,000 inhabitants and open the way to eradication of leprosy.

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Leprosy Control Strategy for Low Endemic Situations

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During 2006, there were 68 countries reporting less than 100 new cases and 27 countries reported between 100 to 500 new cases. However, globally 95% of the disease burden in terms of annual new case detection is mainly attributed to 16 countries. Strategy proposed for low endemic countries in the WHO's "Global Strategy for further reducing the disease burden and sustaining leprosy control activities 2006-2010" are: integration of services within the general health care system and strengthening of referral facilities which are integrated to provide specialized care such as diagnosing difficult cases, treating patients with major complications, prevention of disability and rehabilitation.

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The concept of Information Systems includes equally Information and Communication Technology (ICT). For the The World Health Organization (WHO), an Information System is a mechanism for the gathering, processing, analysis and transmission of information, in order to plan, organize, operationalize and evaluate health services. Information should be a detection instrument for priorities, leading to the planning and execution of actions which shape and transform reality. In the area of leprosy, information systems are focused on gathering data on morbidity rates for the disease, generating epidemiological or operational information. There has been a significant advance in information about leprosy. Information systems should provide information, aid in analysis and the return of information to its sources. They should also inform about the disease and minimize its spread, contributing to a reversal of the current situation. An information system needs to be developed with analysis of data at the point of origin, with support for planning and initiatives aimed at improvements in care. As such, it must include sentinel systems for avoidable situations, as in advanced multibacillary (MB) and GII cases which require immediate treatment and investigation. It should also be used to alert managers to critical situations, as in cases involving children. Leprosy elimination programs need to take advantage of information and communication technology in order to improve education and the dissemination of knowledge about the disease. Maintaining and updating of case records in information systems is a means of evaluating progress in eliminating leprosy. Amongst those information technologies most useful in this area are digital versions of imaging, sound and physiological signals. Computerized mapping systems such as GIS provide an excellent means of analyzing epidemiological data, revealing trends, clustering of cases, dependencies and interrelationships that would otherwise remain hidden in data shown only in a tabular format. GIS can therefore be seen as a valuable management tool in the leprosy elimination program, strengthening national, regional and sub-regional capacities for surveillance and monitoring. Other technologies, such as the World Wide Web and Electronic Patient Record (EPR), favour the quality of care for the leprosy patient, and should be more widely used. The major obstacle is human nature: computerization demands an evolution in the mentality of health professionals towards a uniform language with which to codify medical records. The EPR, the main component of a health information system, offers remote and simultaneous access, speed, trustworthiness, ease of use, security, integration with other systems, support for research and constantly updated data. By means of the Internet, an outline of human / machine interaction – medical cyberspace – is being traced. A “virtual medical community” is possible, as seen in projects like the Hospital Virtual, discussion lists and in the increased use of e-mail and the Web. Using the “Ciberambulatório”, a doctor can fill in a patient’s details and receive a second opinion regarding the diagnosis. The “Tutor Eletrônico” offers educational content about various diseases. Telemedicine related to leprosy promotes medical assistance and education in geographically distant places. Most influent in terms of medical literature is MEDLINE but other sites, such as MedScape, HealthGate and HighWire Press offer medical information. Lists of note are those of the WHO, the French-language Association of Leprologists and Dr. Noto’s List. It should be mentioned that this presentation on information systems in leprosy has followed all the steps in the formulation of an information system: content research on the World Wide Web, data gathering, and dissemination of current and future applications in the treatment of leprosy.

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Buoyed by the achievements of WHO propagated MDT- The broad policy recommendations (starting 1998) were to integrate vertical leprosy services within existing general health care delivery system. By March 2004 the strength of the erstwhile leprosy staff were reduced to 25% of the original-to sustain leprosy services in the periphery. The Programme Implementation Plan (PIP) for continuation of NLEP had indicated that under MDT services a suitable referral system is to be developed. Formations of the district nucleus under District leprosy officer was to be the backbone and it was to continue. To further reduce the burden of leprosy and to extend better utility of services after the integration, WHO (2005), ILEP (2005) and IAL (2005) prepared documents and recommended better coordination between government and non-government agencies, local health agencies, dermatologists, other related specialists (in government service and Medical colleges) and private practitioners to aid in the system of correct diagnosis and delivery of MDT. Realising the need to sustain expertise ILEP promised to continue to provide their assistance in capacity building of generalists till they acquired the skills to take care of problems such as reactions, planter ulcers and disability prevention care and medical rehabilitation (DPMR) being part of the referral system. Because of many different ways leprosy patients are managed by different health services in different countries (health services –coverage, quality, training,

supervision) same guidelines cannot be applied to every situation being considered for referral. Referral however, would remain an essential component of the integrated health services to provide quality leprosy services to ALL. Integration and referral are supposed to ensure wider equity and accessibility, cost effectiveness and long term sustainability, reduction of stigma and discrimination and AVAILABILITY OF THE EXPERTISE TO ALL. Referral means sending of a difficult or complicated case to a specialist for proper care. There can be different levels of expertise available and so different levels of referral. Peripheral, Intermediate and Specialized care. Peripheral level: care would only involve referring all patients with suspected leprosy. Intermediate level: Confirmation of diagnosis and provision of treatment, slit skin smear, disability testing and grading, physiotherapy, medical, surgical, ophthalmic and dermatological care, treatment of reactions and POD. Specialized care: Same as above- additionally sensation and muscle testing, skin biopsy, reconstructive surgery, community based rehabilitation (CBR). It needs to be emphasized that this division about the availability of the services is not absolute. Health workers may be doing much more at the peripheral level and similar maybe the situation at the intermediate level- providing the best of the services especially in the leprosy endemic areas. Referral is primarily required for : 1. Diagnosis of doubtful cases especially when the cardinal signs are not clearly discernible 2. Cases with reactions not responding satisfactorily to 4 weeks of steroid treatment. 3. Complications with involvement of the other system(s) including the eye. 4. For reconstructive surgery. 5. Suspected relapse / drug resistance. 6. Counseling, rehabilitation and CBR 7. Severe infections of hands and feet 8. Serious adverse drug reactions. All referral cases have to be sent back from where they came for further management to maintain contact with local health workers. It is to be remembered that supervision is essential at all levels of patient care. So recording, reporting and monitoring are essential for the PROGRAMME to know the trends, viz. Proportion of new cases presenting with grade 2 deformities, child cases, sex ratio and ratio of multibacillary cases, new cases correctly diagnosed, defaulters and relapses to: Review, Formulate new strategies and Organize Logistics. Healthier health system and a good referral set up will automatically take care of the human rights and reduce/even eliminate discrimination and stigmatization of the leprosy patients. To sum up, the basic aim of the referral would mean that the shift has to be from numerical to quality (targets to be avoided) in management POD and community based rehabilitation.

Split Plenary

R-I : *M. leprae* Genome

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Genomic Diagnostics : Bio-Informatic Approach to Develop New Tests for Early Detection of Leprosy

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Preclinical *M. leprae* infection is likely to form a major source for leprosy transmission. Therefore, early detection of individuals infected with *M. leprae* is crucial. However, to date there are no diagnostic tests available that can identify preclinical leprosy. Newly developed HLA based bio-informatic tools combined with comparative genomics recently created novel opportunities to help combating this disease and design improved tests for early detection of *M. leprae* infection. Using this post genomic HLA-based approach, we were able to identify candidate proteins and peptides unique to *M. leprae* containing predicted T cell epitopes restricted via several major HLA-class I and II alleles. Since the selected genes were of unknown function, their expression in *M. leprae* bacilli was assessed. Recombinant proteins were used to stimulate PBMC from leprosy patients, household contacts, TB patients and healthy endemic and non-endemic controls individuals. Evaluation of the immunogenicity of the antigens in PBMC from a Brazilian population showed that 5 candidate antigens induced significant levels in paucibacillary leprosy patients, reactional leprosy patients and IFN- γ exposed healthy controls, but not in most multibacillary leprosy patients, tuberculosis patients or endemic controls. Importantly, among exposed healthy controls 71% had no detectable IgM antibodies to the *M. leprae* specific PGL-I, but instead responded to one or more *M. leprae* antigen(s). To improve the diagnostic potential of these *M. leprae* sequences, synthetic peptides spanning all 5 *M. leprae* proteins were analyzed similarly. Determination of cumulative T cell responses towards 4 of these peptides that activated PBMC of leprosy patients increased the sensitivity compared to single peptides to 100% in PB, 75 % in Rx and 93 % in HHC, without compromising specificity. Since diagnostic tools should be applicable in several populations regardless of the genetic background, these *M. leprae* antigens are also tested in populations on the African (Ethiopia) and Asian (Nepal) continent.

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Molecular Epidemiology of Leprosy and Applications in Endemic Situations

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To better describe and compare the factors that lead to continued occurrence and transmission of leprosy against the backdrop of local and global multidrug therapy (MDT) being implemented for nearly 25 years, we have consolidated a collaborative international research program involving endemic countries in Asia (Philippines, India, Thailand and China) and S. America (Colombia and Brazil). Observations will be presented regarding the identification and distribution of patients and the *Mycobacterium leprae* genotypes in various settings to discern transmission patterns and linkages, and on the surveillance of *M. leprae* resistance to MDT in new and relapsed patients. Strain typing of *M. leprae* is currently achieved by mapping alleles at a minimum of 15 short tandem repeat (STR) loci and three known single nucleotide polymorphisms (SNPs) using DNA extracts from clinical specimens such as slit skin scrapings and biopsies. Throughput is being enhanced by multiplex PCRs, automated fragment length analyses and other DNA sequencing independent techniques. Variations in the patterns of alleles and their frequencies in *M. leprae* strains within and between geographically separated populations indicates that STR loci can be suitable for short range transmission, while also separating long range dispersion events. For detection of drug resistance to rifampicin and dapson, selected regions of the target genes, *rpoB* and *folP1* respectively, are subjected to PCR and DNA sequencing. During the year 2006, *rpoB* mutations were not detected in patients presenting in a skin clinic in Cebu, Philippines, while 2 cases were found in relapsed patients in a Colombian leprosarium. Common and novel *folP1* mutations have been detected in India and China. These efforts are aimed for delivery into the clinical community for routine diagnosis, patient care and effective leprosy control. This research is supported by grants from the National Institute of Allergy and Infectious Diseases, NIH, and the Heiser Program for Research in Leprosy and Tuberculosis through IDEAL.

Analysis of Genes of *Mycobacterium leprae* Associated with Drug Resistance in Samples from Brazilian Leprosy Patients

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Introduction : Data on the prevalence of drug resistance among leprosy patients are scarce but some reports demonstrate the existence of mono- and multi-drug resistant cases. **Objectives :** To evaluate the drug resistance rate among Brazilian leprosy patients and the contribution of the latter to relapse of the disease. **Methodology :** Sequence analysis of the genes *rpoB*, *folP*, *gyrA* and *gyrB* of *Mycobacterium leprae* was performed on PCR products generated from a fraction of processed skin biopsy samples collected from leprosy patients diagnosed as part of a prospective study designed for optimal case finding of relapse cases. **Results :** After one year of sampling, 112 skin biopsies from different patients being considered as relapse cases and from five states of the country were collected. Sixty-three samples were processed and submitted to PCR amplification for analysis of the four genes. At the current stage, part of the PCR products were purified and PCR and sequencing conditions established that generated readable *folP* and *rpoB* sequences. **Conclusion :** Biopsy processing allowed PCR amplification of the four genes and purification yielded products that at least for two genes resulted in good quality sequences. SNP analysis is underway using SeqScape.

Implications of Gene Expression in *Mycobacterium leprae*

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Annotation of the *M. leprae* genome defined a genome with < 50% protein coding capacity and 1133 pseudogenes. To identify the minimal gene set important during infection, we surveyed mRNA transcripts from nude mouse-derived *M. leprae* using RT-PCR and DNA microarray technologies. Approximately 1350 transcripts were detected, including 55% protein coding genes or open reading frames (ORFs) and 43% pseudogenes in the genome; demonstrating the highest rate of pseudogene transcription to date. ORFs detected are involved in DNA replication, cell division, SecA-dependent protein secretion, energy production, intermediary metabolism, iron transport and storage and genes associated with virulence. Results suggested that *M. leprae* actively catabolize fatty acids and glucose for energy, produce a wide array of secretory proteins, utilize the limited number of sigma factors (transcription initiators) available, transcribe several genes associated with virulence in *M. tuberculosis* and produce several proteins involved in iron transport, storage and regulation in the absence of recognizable genes encoding iron scavengers which suggests a novel mechanism of iron scavenging in this bacterium. Since translation of this large number of pseudogene transcripts could impact *M. leprae*'s energy consumption without benefit to its survival, bioinformatics tools were used to identify translational 'silencing' mechanisms of these pseudogenes. Results demonstrated that the majority of transcribed pseudogenes lacked translational start codons, lacked strong Shine-Dalgarno sequences, had multiple 'in-frame' stop codons, and low predicted functionality. Taken together, these data suggested that one half of the functional genes of *M. leprae* are expressed during infection and even though a large number of pseudogenes are transcribed in *M. leprae*, most are phenotypically 'silent' and therefore most likely do not impact the infection process.

R-2 : Community Based Rehabilitation

Economic Advancement Movement in Korea

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The Economic Advancement Movement (EAM) in Korea has uniquely compared to other countries and has received attractive attention from many all over the world. This is a remarkable movement – winning out on two fronts : medical treatment and social aspects. Both of them are key in eliminating Hansen's Disease (H.D.). By creating a framework of self-support and government support, those who were fit for work escaped from living in a group and/ or being compulsorily segregated, took the first step for EAM in Korea. However, we encountered many problems, but solved within the current system centering around government and academic circles. Once a forceful crackdown on begging increased, taking these problems into our hands with an internal clean-up, we were able to restore dignity by ourselves which was beginning of EAM. We have achieved self-support with 40 years of painstaking efforts and assistance from others, whose goal is elimination of H.D. Currently we are deeply involved in Korea government's policy decision on H.D. freely extending our opinions.

Ninguém Se Reabilita Sozinho

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O autor descreve sobre a sua reabilitação, desde quando aos 13 anos de idade recebe a notícia de que era portador de hanseníase, até os dias de hoje quando trabalha como dirigente da sede histórica do Movimento de reabilitação dos hansenianos no Brasil (MORHAN) e como trabalhador da saúde.

Disabled in Health, But not in Spirit

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I was born in 1955 and finished high school in 1972. But before I could even picture my future, it had already been ruined by leprosy. In merely two years the illness got worse and worse and I developed disabilities in my eyes, hands, and feet. It took nearly 10 years for me to be cured. In 1983 I was able to go back to my hometown. My disabilities deprived me of the chance to participate in farming, nevertheless I did not give up. I raised ducks, I sold aquaculture products, and I traded waste materials. Although social discrimination and physical disability resulted in many difficulties, I never gave up and after some years' effort I even achieved the financial ability to help others. I began to raise cattle at the end of 1993, even though I had lost a leg by this time. After being successfully fitted with a prosthesis, I restarted my career to seek a meaningful and independent life. I started raising cattle from scratch and before long I expanded the business into cattle-trading. With the support of HANDA's Economic Rehabilitation Project I established the Center for Cattle Trading. After several years' effort, the Center has developed abundant experience in cattle raising and trading. Now its annual amount of raised and traded cattle has reached more than 200; and the associated income has also increased several times. It not only provides me a sufficient life, but also enables me to help many others who also facing the challenges of leprosy. In order to promote interactive support among the people affected by leprosy in my city, in 2002 HANDA Honghu Branch was established. My own experience received recognition and I was elected as president. From then on the people affected by leprosy in Honghu have had the opportunity to gather together and help each other. The members often visit the people to find out their difficulties and needs and encourage them to begin some economic development programs. With the support of the HANDA small loan project, they not only successfully launched activities like domestic livestock-raising and earned a better living, but also regained self-dignity and recognition from neighboring villagers. Several years' endeavor and practice have taught us that the only way for the person affected by leprosy to live with dignity is through unity, mutual support and self-esteem. We must rely on ourselves rather than others. The welfare from the government is limited, and help from relatives and friends is also limited. Dependence on the aid and sympathy of others tends to aggravate social discrimination. Only if we become self-confident and mutually supportive and empowering, can we receive social recognition and regain dignity.

Women's Self Support Programmes in Nigeria

Mary Amylike

Prakash Patil

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1. Common Vocational Training Project (CVTPH) was established in 1982 under the guidance of late Mr. & Mrs. Moolgaonkar and late Dr. Jal Mehta with an aim to provide training and rehabilitate the leprosy cured patients and to prove that handicapped persons are also capable of quality production in an Automobile Industry.
2. Due to the social stigma, these cured persons were kept aloof from the society till 1987. In order to overcome this stigma, late Dr. Jal Mehta with his untiring effort started this society, (Dr. Minoo Mehta Society) comprising of 56 society members.
3. Later on reputed companies like Tata Motors (TML) Lucas TVS, Poonawalla group known for their generosity in promoting this noble cause came forward and extended help by giving us work for their companies. With this help the society has a turn over of 3 – 4 lakhs per month (labour charges only) at that time.
4. Due to the sudden demise of Dr. Jal Mehta in 2001 the society was under a new management from 2002 to 2004. Unfazed by this loss the society carried on the good work and attained ISO 9001-2000 certificate as required by TML. Unable to cope up, the administrative body handed over the complete working to the society, but unfortunately without any financial aid or help.
5. All type of taxes, such as Excise, VAT Cess, CST, Income Tax are levied on us as no exemption is granted to us. Even then we have not asked for any loan or grant from bank or government of which we are proud.
6. In 2005 we successfully completed “Kaizen Methodology” which guides us for improvement in production. In keeping pace with TML, we also attained TS 16949-2002 certificate (Technical Specifications), the only of its kind to be given to a handicapped society in the world.
7. At present the society comprising 115 society members.
8. A brief production target which we have achieved during the past 3 years.
 - a. 2004 – 2005 Annual turnover of Rs.43500000. Rupees four crore thirty five lakhs only.
 - b. 2005 – 2006 Annual turnover of Rs.53500000. Rupees five crore thirty five lakhs only.
 - c. 2006- 2007 Annual turnover of Rs.58900000. Rupees five crores eighty nine lakhs only .
 - d. 2007 – 2008 Annual turnover of Rs.80000000. Rupees eight crores proposed.
10. In future if we get any financial assistance we will increase the workload and rehabilitate more 300 members.

Neeia Shah

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Community based rehabilitation (CBR) is defined as a strategy within community development for rehabilitation. It involves equalization of opportunities and social integration of all people with disabilities. CBR is implemented through the combined efforts of disabled people themselves, their families and communities, and the appropriate health, education, vocational and social services”. (1994 Joint position paper of ILO, UNESCO and WHO). In this context there are several people and organizations in India who are promoting CBR activities. A wide range of activities is included beyond medical care and rehabilitation. Among these our organization is involved in preventing the causes of disabilities, providing rehabilitation services, facilitating education and training opportunities and supporting micro and macro income generation opportunities. Rehabilitation is envisaged as providing disabled people with tools they require to attain independence and self determination, including compensation for loss of function. There is no better example than development of grip-aids and continued research in ergonomic independence. Novartis Foundation developed the Modulan grip-aids for advanced hand deformities in orthopedic and leprosy handicap. Local organizations used the epoxy resins available in the local market, to help their patients. The latest grip-aid made of Velcro-

R-3 : HIV and Leprosy Co-Infections

L-67

Leprosy- HIV Co-Infection Overview

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There is an interesting and still evolving interaction between leprosy and HIV. I shall review the effects of leprosy-HIV co-infection on the manifestations of leprosy. Being HIV positive does not appear to put patients at greater risk of developing leprosy. However the published epidemiological studies are all small, poorly designed and done in the 1990's with often inadequate HIV testing. The histopathological appearance of leprosy lesions shows the same spectrum and the same range of granulomatous appearances as in patients without HIV infection. This even applies to lesions seen in patients whose advanced immunodeficiency where CD4 cells are found in leprosy lesions even when there are very low circulating CD4 counts. There is no good data on the progress of skin lesions or nerve function impairment in patients who are co-infected. One might predict that these patients would be at higher risk of developing nerve function impairment. There is some data suggesting that co-infected patients have higher incidence of Type 1 reactions, but this needs to be confirmed. Leprosy has now been reported presenting as immune reconstitution disease among patients commencing highly active antiretroviral treatment (HAART). These reports have come from Brazil, The Caribbean and Europe these patients present weeks after starting HAART when their CD4 counts are increasing and their viral load falling. The treatment of reactions in these patients is potentially complicated since they require more immuno-suppression to control their leprosy reactions. Well designed contemporary studies of the clinical aspects of Leprosy-HIV interaction are needed especially regarding nerve function. These need to be complemented by immunological studies. These studies will generate data that will guide optimal management of these patients and the complications of their diseases.

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T Cell Responses to Mycobacterial Antigens in HIV Co-Infection

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Early detection of *M. leprae* infection is crucial in order to diminish a major source for leprosy transmission formed by preclinical or subclinical leprosy cases. Thus, development of new diagnostic tests for detection of preclinical *M. leprae* infection is studied by several research groups at the moment. Cell-mediated immunity (CMI) plays a crucial role in the protection against mycobacterial infections, therefore several of these tests are based on T cell responses directed towards mycobacterial antigens. Individuals infected with both HIV and *M. leprae* are expected to show lack of or severely decreased T cell responses directed against major mycobacterial antigens due to the decreased numbers of CD4+ T cells. In addition the effect of successful restoration of the number of CD4+ T cells by HAART is unclear. However, studies on the effect of HAART in TB co-infection show only partial restoration of anti-mycobacterial immunity. In this presentation some issues that will be studied in leprosy co-infection in order to fill the gaps in our knowledge on T cell responses in HIV/ leprosy co-infection will be discussed. **Support:** Gastmann Wichers Foundation, The Netherlands.

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Clinical Experiences with Co-Infection in Brazil

P Deps

L-70

Clinical Experiences with Co-Infection in Ethiopia

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Tuberculosis is an important opportunistic infection among HIV infected persons and the course of the diseases is altered by HIV co-infection and vice versa. It is also reported that in HIV infected persons latent tuberculosis may manifest as clinically relevant disease. Treatment of this co-infection (especially TB and AIDS) may have to be modified due to the associated interaction of drugs used for the treatment of these diseases and also the changes in the immunity of the individual due to the co-infection. There is substantial scientific interest in leprosy and HIV co-infection due to the several similarities of leprosy and tuberculosis namely both caused by the same group of microbes which are relatively slow growing (although leprosy bacillus cannot be cultured in artificial medium); have a long incubation period; bacilli may remain dormant for variable duration; changes in host CMI affect the outcome of the diseases; most of the drugs used for treatment are the same but with a different dosage schedule; endemic in developing countries and affecting the poor strata of the society. There have been several case reports of leprosy and HIV co-infection in the past decade. Most of the reports do suggest that clinical disease of leprosy was manifested after varying time interval of HIV co-infection and also after clinical manifestation of AIDS. This was associated with demonstrable sero-positivity to HIV as well as decrease in CD4 counts in patients presenting with AIDS. There were some alterations in the response of the patients, like precipitation of reactions and/or worsening of the diseases in some cases, but it is not clear whether it was due to the institution of HAART or recrudescence of the disease. With the recognition of Immune Reconstitution Inflammatory Syndrome (IRIS) after successful implementation of HAART, it has become very difficult to distinguish between the two. Never the less it is important from the treatment point of view to diagnose these co-infections. Workers have estimated the HIV prevalence in leprosy patients in some of the endemic countries. Some have reported a rise in the HIV sero-prevalence in leprosy patients, this is probably is of much less magnitude as compared to the HIV sero-positivity present in the non-leprosy disease affected population. More over there was no change in natural course of the disease in the studies carried out in Ethiopia. Overall, relationship of HIV with leprosy has been observed to be quite different compared to co-infection in HIV and tuberculosis. We have studied the HIV sero-prevalence in leprosy patients in two phases between 1989-1993 and 1999-2004 on different group of leprosy patients attending the out patient department of our Institute. There was a marginal rise in the sero-prevalence from 0.12% to 0.37% in the second phase. All the sero-positive cases are being followed up six monthly for noting the disease progression as well as the serological status. The CD4 counts were also done in these sero-positive patients. At present all the patients have responded to the standard MDT regimen, there has been no relapses or increase in severity or incidence of reactions in these patients. CD4 counts were also found to be normal in these sero-positive leprosy patients. In none of them the disease has progressed to AIDS. There is paucity of data from India about complications like IRIS and situation needs to be closely monitored by creating awareness among clinicians to diagnose leprosy in HIV-AIDS cases.

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HIV and leprosy co-infection is likely to become more common in the future. HIV infection is increasing in India, which accounts for 70% of incident leprosy cases worldwide, as well as in other countries with a significant leprosy burden, such as Brazil and Nepal. The implementation of anti-retroviral therapy (ART) in these countries and those of sub-Saharan Africa, which have experienced longstanding HIV epidemics, means that subjects with HIV and leprosy co-infection will live longer, giving opportunity for the two infections to interact over a more protracted period. Until the present time, epidemiological and clinical studies have suggested that HIV co-infection does not have a marked effect on the risk of developing clinical leprosy, the pattern of leprosy or the frequency of leprosy reactions. These studies, however, have been limited in size and design (reviewed in Ustianowski¹), and with the increased frequency and length of co-infection, it is possible that HIV may be found to have a more significant effect on disease caused by *M. leprae*. To understand the longterm implications of co-infection, it will be important to conduct large, prospective case/control studies to determine if HIV increases the risk of leprosy or leprosy reactions and clinical-pathological studies to determine if HIV co-infection changes systemic or local immune responses to *M. leprae*. The optimal treatment of reactions with corticosteroid therapy and its attendant risks of Tuberculosis and other opportunistic infections in the presence of HIV have yet to be defined. Further, it is clear that treatment of highly immuno-suppressed HIV/AIDS patients, who are harbouring *M. leprae* infection, with ART may precipitate Immune Reconstitution Inflammatory Syndrome (IRIS) in the

form of severe reversal reactions in the skin and nerves. In addition to increasing awareness of this possibility in leprosy endemic areas, it will be important to understand the immuno-pathogenesis of skin and nerve damage during “leprosy IRIS” and to define its optimal therapy, which may differ to that for uncomplicated Type 1 reactions. Finally the reliability of serological testing for HIV in multibacillary leprosy must be established. There are major challenges in conducting these studies in a timely manner. The prevalence of leprosy is less than that of tuberculosis and other infections in countries where HIV is major threat to health, and with integration of health services the expertise in leprosy required to conduct these studies may be limited. The following are required to address these challenges:

1. design of multi-centre studies to aid the recruitment of leprosy/HIV co-infected patients and the applicability of findings across regions;
2. agreement on criteria for definition of leprosy, leprosy/HIV coinfectd cases and control subjects for epidemiological studies, and on case definitions for leprosy reactions and “leprosy IRIS” for use in immuno-pathological studies;
3. availability of high quality HIV laboratory services to confirm the diagnosis of HIV infection, using confirmatory serological and viral DNA assays, and to measure CD4 T cell levels in co-infected patients;
4. availability of laboratory services to monitor histological and immunological changes in co-infected leprosy patients during ART;
5. agreement on treatment and outcome measures for leprosy reactions and “leprosy IRIS” in co-infected patients to permit comparison of outcomes in different centres.

These activities would be facilitated by the formation of an interest group to study leprosy and HIV coinfection.

¹Ustianowski AP, Lawn SD, Lockwood DNJ, Interactions between HIV infection and leprosy: a paradox. *Lancet Infect Dis* 2006, 6:350-60.

R-4 : Empowerment

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An Empowered Woman is a Woman Capable of Clothing Herself with Dignity

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IDEA's International Womens' Opportunities Program - IDEA, Brazil

There are thousands of historical reasons for the submission of women. Although the struggle for equal rights and dignity is recognized, the disempowerment of women is present in the every day lives of poor women and is increased in many of them due to the fact that they have carried the Hansen's disease bacillus in their bodies. With the physical signs of the disease and hidden lives in their homes, many women who were affected by Hansen's disease began to group themselves in wide circles of conversation, where they could talk about themselves and for themselves. This discussion circle is like a garden, full of flowers and hope, a place where the women can let loose the words and feelings imprisoned in their hearts. Very slowly they loosen the knot that held their lives in anonymity, in fear, and from the deafening suffering that disempowerment provokes. The freedom to be and to talk about themselves and for themselves enables the creation of the capacity to clothe oneself with dignity, dignity that is based on one's own convictions. New spaces were occupied outside their homes. The women joined other groups in the community. A woman clothed with dignity is capable of generating economic independence. A woman clothed with dignity is capable of generating ethics in human relations, lightness and beauty in the empowerment of Being Herself. A woman clothed in dignity loves gratuitously. She defends her rights – the instrument of her struggle and the foundation for her self-empowerment.

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Political Empowerment

Veldenora Da Cruz Rodrigues

Brazil

Grassroots Empowerment in Ghana

Kofi Nyarko
IDEA Ghana

I tried to start our empowerment efforts with radio stations, but I saw that this would not solve our problems for many people in Ghana do not have radios and televisions. Even if they have them, how many people will listen to me on the radio at a specific time? So I needed to reach people in their communities by seeing the chiefs of the communities or the elders of the families. They gave me authority and the time that was OK for me to meet with them and at that time I went. I visited so many places in Ghana, camp by camp and community by community, school by school and door by door! And these visits brought attention and many people got to know what IDEA GHANA's teachings are about! This door to door grass roots empowerment did not help only those who had Hansen's disease but also those who have HIV. I had many experiences when I was doing this grassroots empowerment. I met many people who have been rejected for so many years. I also got to know that some of the people who had this disease thought that since they have had leprosy they will be rejected even after they have finished the treatment. But with the help of IDEA, when they got back to their families and communities, they welcomed them and there is no discrimination anymore. At first those who had leprosy had their own schools within the leprosy camps or in their hospitals, but now they can go to any school without any problem. In Ghana these days people have the belief that if something has happened to you today anything can happen to me tomorrow, so they should not discriminate against anybody, no matter if they have Leprosy or HIV or any kind of disease or disability. So I can say people in Ghana are now free and I hope they will be free for ever! And also this grassroots empowerment did not end in Ghana. We went to DR Congo and I wish you were there to see how happy the people of DR Congo were and how they welcomed us. "Ah, we have been waiting for this for 30 years now" said one man. And we were able to establish IDEA DR Congo west and east.

Empowerment Through Education of Children

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Children are the promise of humanity for tomorrow. Education plays a pivotal role in the growth and development of any society and nation. The persons affected by leprosy were thrown out and used to settle down by themselves and families in places called as leprosy colonies. The children of leprosy patients as well as children affected by the disease needed financial support to pursue their education. Due to the difficulties in finding resources they used to drop out from schools. Just because the parents are affected by leprosy and unable to support their children, the normal growth of these children should not be affected. If no intervention is done to support them, then they will become a burden to the society in the future. To overcome the above scenario IDEA India had launched the children education programme and support over 1200 children every year who live in the leprosy colonies and in the community. Many children who had completed their education were placed in good jobs after completing their education. They support their parents. After employment they have taken back their parents from the Government leprosy Homes to live with them. Various educational support rendered through IDEA India have enabled the families to get empowered, to improve their quality of lives to have an integrated life in the society with dignity. Providing education to the future generation is a genuine need and desire of human society. It gave many opportunities for them. We thank Sasakawa Memorial Health Foundation, Japan, IDEA International, Emmaus Switzerland Leprosy Relief Organisation who are providing their support for implementation of this programme.

Overcoming Discrimination Against Women in Nepal

Parwati Oli
IDEA Nepal

There are innumerable problems related to the fundamental rights of women in Nepal. Women are deprived of their basic rights. They have not been able to utilize their rights as men can. Nepal is a male-dominated country, therefore many decisions are made in favor of men and women are not involved in different social activities. Women are limited in household work and their work is devalued and felt to be worthless. Most Nepalese families are uneducated. They do not know the importance of education, so they rarely send their daughters to school for education. Women are deprived of education and other social and political rights. Widows are not allowed to get remarried. They have to sustain their life without marriage after the death of their husbands, whereas a husband can get married after the death of his wife. Widows cannot expose their internal feelings in society. They are to hide their feelings inside their hearts. In the context of Nepal, when a woman suffers from leprosy, she is sent out of the village. She is hated in society. She is thought to be cursed by god. Due to lack of education and knowledge, it is not known that leprosy can be cured with treatment. A woman has to divorce her husband when she has leprosy. Women have to leave their homes even when they are pregnant. Therefore it is said that the life of a woman with leprosy becomes pitiable and miserable after marriage. After the advent of democracy in Nepal, the status of women is being improved. Their rights are also being saved. Women are raising their voices to better their conditions. IDEA Nepal is working for the empowerment of women for example through the First Empowerment Workshop for Women that was held in 2006. IDEA Nepal is trying to remove discrimination against women and help women to realize their rights. Education brings change in society. Unless people are educated, their problems will remain the same in the future.

R-5 Pathology of Leprosy

L-78

Immune Mechanisms in Reactions

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Leprosy reactions are responsible for a major component of nerve damage and morbidity in leprosy. A detailed understanding of the immune mechanisms underlying these reactions is essential to devise more effective control measures. Type 1 or Reversal Reactions (T1R) are caused by increased cellular immune responses to *M. leprae* antigens in the skin and nerves, marked by infiltration of activated CD4 T lymphocytes and macrophages. Studies in the last five years have demonstrated the increased expression of pro-inflammatory cytokines, TNF, IL-1b, IL-6, IFN-g and IL-12, and immunoregulatory cytokines, TGF-b and IL-10, in reactional skin lesions, along with evidence of macrophage activation. Although there is a fall in lesional cytokine mRNA levels with corticosteroid therapy, there is still increased expression of some cytokines at 6 months. Changes in plasma cytokine levels are not consistently associated with T1Rs, however IFN-g and TNF responses of peripheral blood lymphocyte to *M. leprae* antigens are increased in T1Rs, fall with therapy, but rise again as corticosteroids are withdrawn. Patients with poor neurological outcome and increased clinical symptoms have sustained increases in *M. leprae*-induced TNF responses during therapy. These studies highlight that the increased inflammatory response in T1Rs may persist for >6 months and is consistent with the recent evidence for increased effectiveness of longer duration corticosteroid therapy for T1Rs. Type 2 Reactions (T2R) or Erythema Nodosum Leprosum (ENL) are a generalised inflammatory response involving the skin, nerves and other organs in LL and BL leprosy patients with a high bacillary load. The histological appearance is of a small vessel vasculitis with neutrophil infiltration, and the original studies showed localised deposition of immunoglobulin and complement in ENL lesions, consistent with immune complex formation as the principal pathogenesis. There are additional features of the immune response in ENL. First, there is marked dysregulation of TNF production, in excess of that observed in other immune complex mediated diseases to viral or self antigens. There is marked elevation in serum TNF and increased TNF mRNA and protein production by macrophages and lymphocytes in response to *M. leprae* components in some, but not, all ENL patients. Second, there is evidence of activated T cells in the ENL skin lesions, with increased mRNA for IL-12 and local changes in lymphocyte subsets compared to nonreactional lepromatous patients. The preferential response to thalidomide in ENL is different to that in other immune complex mediated diseases, and this involves both inhibition of TNF production and changes in immune regulation. Recent clinical studies have highlighted that the majority of ENL reactions persist for >6 months, consistent with ongoing immune stimulation by persisting *M. leprae* antigens in the tissues. The evidence for persistent immune activation in both types of reaction supports the notion that the management of leprosy reactions should be similar to that for other chronic immune-mediated inflammatory diseases, such as vasculitis, rather than as acute episodes. The optimal management requires "Induction" therapy to suppress both T cell activation and cytokine production and the resulting tissue inflammation, and then "Maintenance" therapy to allow maximal functional recovery and to prevent recurrence.

L-79

Global Collaboration in Leprosy Research – INFIR Study

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Recent trends in the organisation, funding and conduct of medical research are towards multidisciplinary, international collaborations that seek to address the key questions that would make a difference to the global health. This trend results in large programmes of research targeted to priorities agreed by communities, funding organisations and the scientists. INFIR is an example of this trend and more such initiatives are needed that make major advances that benefit patients and their communities. INFIR is the ILEP Co-ordinated Programme of Research on Nerve Function Impairment and Reactions in Leprosy. The need for research in nerve damage and reactions was identified at an ILEP working session in December 1997, an expert workshop was conducted in June 1998 to develop proposals which were approved for funding by Follereau Luxembourg with support from LEPRO UK, and TLMi in December 1998. A steering group was established in February 1999 chaired by Jo Colston. The programme involved co-operation between field centres, field laboratories and Universities with field work in Asia, Africa and South America. INFIR had 4 components: a Cohort study to investigate prediction, detection, and pathogenesis of nerve impairment in new patients, trials of new treatments for reactions, a study of recurrent and late reactions, and studies of delay in detection and treatment of leprosy. One important product was the development of standardised methods that are now in

widespread use in leprosy research. Findings from the cohort study include the relationship between monofilaments and voluntary muscle testing and neurophysiology, neurophysiology studies show nerve damage is much more widespread than is clinically apparent, nerve conduction and temperature testing are important, and nerve function improves with MDT. The treatment trials demonstrated that steroids remain the first line therapy with second line drugs such as azathioprine and cyclosporin having steroid sparing benefits. Recurrent reaction and chronic reaction have been defined and methods developed are now being used in research. Methods to study delay were developed based on field studies conducted in Bangladesh, Nepal, India, Ethiopia, Malawi, Brazil, and Paraguay. A booklet has been produced for field programmes on how to find the reasons for delay. INFIR has been a highly productive research initiative that contributes to prevention of nerve function impairment and better treatment of reactions. The ILEP co-ordination model adds value to research in development of standardised methods, multi-disciplinary approaches and international collaboration. A similar model has been adopted by the IDEAL project to develop tests for early diagnosis and understand transmission. New research of this nature is vital in leprosy.

L-80

Serum Proteomics of Leprosy Patients and *M. leprae* Infected Mice

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Proteome profiling allows better understanding of disease progression, subtype classification, susceptibility patterns and disease prognosis. Leprosy is a spectral disease with clinically, histologically, immunologically and bacteriologically distinguishable subtypes. In addition, a significant fraction of patients undergo immune mediated reactions even after multidrug therapy (MDT). Erythema nodosum leprosum (ENL) is an immune complex mediated reactional condition in leprosy, characterized by a systemic inflammatory condition afflicting borderline lepromatous (BL) and lepromatous leprosy (LL) patients. We have analyzed serum proteome of leprosy patients undergoing ENL reactions and compared it with that of healthy noncontact controls. After depletion of albumin and immunoglobulin G (IgG), two dimensional gel electrophoresis (2DE) of these serum samples was performed. Differentially expressed proteins were identified by MALDI-TOF and MALDI-TOF MS/MS mass spectrometry. Significant increase in one of the isoforms of alpha 2 chain of haptoglobin was observed in ENL condition. In addition, haptoglobin phenotype was determined for healthy controls and leprosy patients. Hp 0-0 phenotype was detected in 21.4% of ENL patients undergoing treatment, which on follow up examination showed typable phenotype thus showing a condition of acquired anhaploglobinemia. Since ENL still remains a threat of leprosy disease management, the above finding provides new insights in understanding the development and progression of this inflammatory condition. In order to examine the plasma proteome profile a complementary study was initiated using plasma from mice infected with *M. leprae*. Analysis revealed disease specific changes in the infected mice plasma. The proteins showing changes in expression level were quantified using DIGE analysis. MALDI TOF mass spectrometry and MS/MS analysis were done to identify the proteins which showed significant changes. These results will be discussed in the broader perspective of proteome analysis in infectomics.

L-81

Kineomics in Leprosy Pathology : Limitations and Prospects

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Despite advances in the knowledge of the key players viz. resident and immune cells and their associated soluble products, the understanding of the pathology of the unique leprosy spectrum and associated reactions remains enigmatic. In the last decades, investigators have studied the role of cytokines and chemokines in the evolution of leprosy pathology or in the search for suitable biomarkers of the disease activity. These studies demonstrated the association of these molecules with leprosy as compared to healthy controls and contacts. However different studies have shown considerable variation with respect to their association with the leprosy spectrum and reactions. Furthermore, no strict cytokine and/or chemokine profile could be specifically associated with leprosy as compared to other infections or inflammatory conditions. Our studies in circulation and within tissues assert the fact that evaluation of cytokine profiles and soluble factors is useful in monitoring disease activity and of limited value in either predictive diagnosis or elucidation of the complex pathology. These limitations arise probably due to both individual variations within a population and between different populations. Despite these limitations, research should continue using modern technologies like cytokine and tissue arrays as "kineomics" in parallel to proteomics and genomics. **Keywords:** Pathology, cytokines, chemokines, biomarkers.

R-6 : Diagnostics

L-82

Diagnostics ; Challenges in Clinical Diagnosis

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Leprosy is a disease affecting mankind since times immemorial. It still continues to be an enigmatic disease even after the genome of leprosy bacillus has been fully deciphered. Despite several advances made in understanding this disease many issues still remain and among them one most important is establishing a definitive diagnosis of the disease in specially early stages. As *M leprae* the causative organism of leprosy cannot be grown in any artificial culture medium, the diagnosis of disease in the present settings is based primarily on the clinical appearance and criteria. There are inherent problems of clinical diagnosis which include inter observer variability, eliciting the co-operation of the patient for testing of neurological deficit as perception threshold varies from individual to individual, overlap of several types of symptoms and absence of definitive signs and confirmatory evidence for definitive diagnosis in early forms of disease. Depending upon the endemicity one has to take into consideration the different conditions which come in the differential diagnosis like post kalaazar dermal leishmaniasis (PKDL), fungal infections and other dermatological / neurological disorders. In the pre-elimination phase the clinical acumen and experience of treating doctors as well as close follow-up of difficult to diagnose cases was used to clinch the diagnosis. In the post-elimination era, with the merger of the leprosy services with the primary health care centres, definitive tests for diagnosis are essential to maintain the elimination phase as well as steer the programme towards total eradication of the disease. With the progress made in deciphering the *M leprae* genome some progress has been made towards the use of molecular probes and amplification techniques in demonstrating genes/their products in tissue specimens. Attempts have been made in establishing the viability of the detected organisms by the use of RNA based probe and amplification methods. Strain differences in the species identified. Some of these tests need to further simplified and validated. However, several easy and simple, tests are urgently required for solving the dilemmas still associated with the disease : Differentiating sub clinical and self healing disease from disease which requires treatment. Effective and reproducible tools for mapping of impairment of sensation and nerve impairments. Easy tests for assessing autonomic dysfunction Accurate assessment of bacterial load and viability. Tests to monitor progress of patients on treatment Distinguishing relapse from reactions etc.

L-83

Novel Immuno - Molecular Approaches

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The availability of the whole genome sequences of *Mycobacterium leprae* and several principal members of the *M. tuberculosis* complex has revolutionized research for immunodiagnostic tools for leprosy. In combination with the miniaturization and simplification of test platforms as well as other developments such as microarrays, immunological rapid tests and new molecular/cellular methods, this has recently provided unique opportunities to renew investigations of unsolved issues in leprosy, including : Early diagnosis of (sub)clinical leprosy patients, in particular PB leprosy Identification of *M. leprae* infected persons using new field-applicable diagnostic tests. Serological testing has been in use for more than 20 years. Until recently these tests were mainly ELISA-based test formats for the detection anti-phenolic-glycolipid-I (PGL-I) IgM antibodies. This type of test has a role to play in the confirmation of the diagnosis of MB leprosy, in classification and for the identification of contacts that are at an increased risk of developing leprosy in future, but its widespread use is hampered by the need of relatively sophisticated laboratory infrastructure and by the fact that results are only available after 24 hours. Two novel, promising developments may revive and expand the use of serology : 1. The availability of rapid tests, which can be applied by health workers with limited training and give results in 10 minutes; and 2. The identification of antigens that may be suitable for PB leprosy and possibly even sub-clinically infected individuals. It is well known that the cellular immune response plays a crucial role in (protection against) leprosy. However, tests to detect and quantify this type of immune response in leprosy have been of limited use because of widespread cross-reactivity with other mycobacteria (in particular TB) and technical complexity. The results of whole genome sequencing have opened up the possibility to identify and study *M. leprae*-specific antigens and peptides. From TB we have learnt that it should be possible to develop antigen-based tests (such as the Quantiferon test), but further development and evaluation will be necessary to make tests that are sensitive, specific and applicable in routine leprosy control programmes. New antigenic targets are being identified which could, after validation, serve as the basis of a diagnostic test capable of revealing infection before clinical symptoms are apparent or of detecting disease in PB patients. Earlier disease detection will result in prompt intervention in the form of chemoprophylaxis or MDT, thereby increasing the likelihood that both the prevalence and incidence of leprosy can be further reduced.

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Immunodiagnosis of leprosy has been one of the main research agenda last couple of decades but is still far from satisfactory. In comparison, immunodiagnosis of tuberculosis (TB), mainly IFN-gamma assays, has been successfully adopted as a tool of detecting *Mycobacterium tuberculosis* infection leading to chemoprophylaxis at least in some countries. While serological tests were main streams for immunodiagnosis of leprosy, IFN-gamma assays replacing the PPD tuberculin test was major focus in TB although there were also tremendous efforts in serodiagnosis of TB. Despite some weak points such as suboptimal specificity, PPD tuberculin test has been widely used for diagnosis of TB in combination with clinical and chest X-ray findings and for detecting latent *M. tuberculosis* infection which requires preventive therapy in certain settings. With discovery of *M. tuberculosis*-specific antigens such as ESAT-6 and CFP-10, more specific IFN-gamma or ELISPOT assays were developed and have been widely used for detecting latent TB infection. However, these T cell-based assays need to be further evaluated in the areas with high prevalence of TB before implementing those assays to TB control programs. High cost will be also another factor for making it difficult to implement T cell-based assays in the areas with limited resources. Considering a wide spectrum of host immune responses to mycobacterial infections, it is impossible to detect all subjects infected with mycobacteria by immunoassays even if combinations of antibody and T cell-based assays. With advantages of simplicity and low cost, several serological tests have been available as commercial kits for immunodiagnosis of TB. Test formats ranged from ELISA, immunochromatography or lateral flow tests, and dot-ELISA using protein and glycolipid antigens and lipoarabinomannan, etc. However, the serological tests have not been widely used in diagnostic laboratories as a confirmatory test for diagnosis of TB, mainly because of unsatisfactory sensitivity and specificity. In addition, there was a wide variation in sensitivity and specificity among studies depending on geographical areas. Heterogeneity of antibody responses to various antigens among TB patients makes it more difficult to develop single antigen-based test. Instead, multiple antigens need to be used in a test to maximize sensitivity despite loss of some specificity. Such serological tests need to be evaluated for their efficiency in detecting latent *M. tuberculosis* infection and active TB in comparison with T cell-based assays. In summary, PPD tuberculin test is still the method of choice for immunodiagnosis of TB while new and more specific T cell-based assays have been gradually adopted for detection of latent TB infection in the areas with low prevalence of the disease. Serological tests employing more than one antigen still need to be improved and evaluated further for potential use in immunodiagnosis of TB.

International Consortium – The IDEAL (Initiative for Diagnostic and Epidemiological Assays for Leprosy) Consortium

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The "Initiative for Diagnostic and Epidemiological Assays for Leprosy" (IDEAL) resulted from two workshops held under the auspices of the TDR programme of WHO, in 2002 and 2003, and set itself the mission of coordinating and facilitating research leading to new tools for leprosy control, and, specifically, the development of new tests, arising from knowledge of the genome of *Mycobacterium leprae*, addressing transmission and infection. Both tests will be developed using well-characterised clinical samples, evaluated in the field and used to gain insight into leprosy transmission and infection. The combination of the two approaches (early diagnosis and transmission studies) will for the first time allow the development of rational interventions for the prevention of leprosy which can then be aimed at those people who are at the highest risk of developing leprosy. The IDEAL Consortium consists of approximately 30 partners in endemic and non-endemic countries with backgrounds in laboratory- and field-based research. A Steering Committee (chair: Prof. P. J. Brennan; co-chair: Prof. H. Dockrell; secretary: Dr. L. Oskam; members: Dr. A. Aseffa, Dr. C. Pessolani, Prof. R. Hussain, Dr. A. Joseph, Dr. J.H. Richardus) was appointed to coordinate efforts to obtain funding and coordinate the activities. In 2004, 2005, 2006, and at this ILC, workshops were organized for IDEAL partners at which activities were identified and assigned. Research development will be reported at various junctures during this Congress. Generous grants were obtained from the Heiser Program for Research in Leprosy and Tuberculosis of the New York Community Trust to support the research and workshops, and the Steering Committee is actively pursuing further funding. For further information on IDEAL please contact the Secretary Dr. Linda Oskam at l.oskam@kit.nl

R-7 : Health Education and Health Promotion

L-86

Using the Public Media to Present Your Message

Manoj Verghese

L-87

Effective Communication

Fione Post

L-88

Psychological Support as Part of Health Education

Zilda Maria Borges,
IDEA's International Womens' Opportunities Program

Several years' experience with psychological support of people affected by Hansen's disease has revealed many problems, including thoughts of suicide, profound indifference in relationships, symptoms of self-abandonment, depression, restrictions in social life, and issues of self-segregation. How does one conduct effective health education under these circumstances? There is no possibility of conducting health education in these circumstances without actively involving the person rather than simply providing information. Health education should be born within the people affected by Hansen's disease. The function of the educator, the friend, of relatives, is to be like a midwife – to help a person to be reborn. To help the person to give new significance to psychological feelings that are triggered by the disease. We need help to be born and for a person who has profound psychological changes to be reborn, they need a lot of support and they need to be listened to. They need someone to walk with them. An important component of health education needs to be creating a network of psychology professionals who are available to help at specific moments such as in chronic cases of depression and attempted suicide after a person is diagnosed with Hansen's disease. At the same time, it is important to create a network of people connected by hearts, that stimulates friendship and a network of friends. It is also helpful to create a network of women, who with their sharp intuition, help to pay attention to the details, to the needs of people who isolate themselves and who are afraid of rejection. There is no medication for emotional pain. Bacurau says that what heals emotional pain is love — love that revives social relations and gives security to people. Love diminishes the profound fear of being abandoned, of suffering prejudice and being stigmatized. Love helps people to regain their identity with dignity. It increases, without a doubt, the desire to live. In our work of psychological support, we also listen to people who have never had the disease. We have found people who had correct information about the disease and the possibility of a cure and also those who were afraid and rejected people because of the disease, who kept away from people even after they were cured. This led us to conclude that the health education process has to go beyond merely providing information. It must help each person change their attitude. It requires an opening up of one's BEING to universal love.

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Health Education in the Community

CS Cheriyan

Introduction : Health Education in leprosy parlance is a dynamic, multi-faceted, information dissemination and communication process. The affected person is the central figure, whose cooperation is the most decisive factor in Health Education program and process. **My first experience when heard that I had leprosy...was bewilderment and dismay :** I felt as though the whole world was shaking and collapsing in front of me. I felt as though the ground underfoot had caved in and I was swallowed live by Earth. I felt totally lost and threatened. It took quite some time for me to recover from that instant shock. That was the first time I became aware of the fact that I had leprosy. **The messages that hit home to me were :** 1. The need and importance of remaining ulcer-free for better social acceptance. 2. The need and importance of specially made protective footwear/prosthetic and orthotic appliances. 3. The scope for rehabilitation and re-integration into the natural environment. They had truly helped me to come this far and continue to exist without any further damage or deteriorations in my physical and mental conditions (except ageing process and disuse atrophies). I continue to benefit from the above till date personally. The FAB walker that was specially made for me by a German Volunteer in 1976, I am proud to state that I am on with the very same one at this moment and continue hopefully till I exist. **How Health Education affected me personally** relates to my personal experiences at Karigiri in the

early 70's from where I received the first ever human touch after my disease was confirmed as leprosy. The wonderful ambience and dedicated staff at Karigiri had given me the most essential love and understanding support when I needed them most. **I can confidently say that I am a successfully launched product of Karigiri. Impact of Health Education :** I am happy to inform this august gathering that after 50 years of living with leprosy and after having spent most part of it as a health worker; I have learnt to transform all kinds of bitterness leprosy had brought to me into sweetness. I am really enjoying every moment of my refocused life through IDEA has been providing me with. **Conclusion :** Let us usher in a dawn of hope for those persons cured of leprosy to enable them to lead a life with dignity, honour and self respect. History beckons us. Let us work **"TOWARDS A WORLD WITHOUT LEPROSY"**. Let us not consider a person cured of leprosy as a **'LEPROSY PATIENT'** anymore, and worst still call him a **'LEPER'** and denigrate humanity. Let us leave a legacy that can honourably be emulated as an ever-lasting tribute to human dignity, as a coveted legacy of this Congress. Let us continue to dream for all that are good for human life and make leprosy work as one such. **"LOKA SAMASTHA SUKHINO BHAVANTHU"**.

L-90

Experience with Telehansen in Brazil

Faustino Francisco

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Advocacy in Global Setting

Jose Ramirez

R-8 : Future of the Last Leprosy Communities

L-92

Resisting Closure of Lo Sheng in Taiwan

Tien-Pei Lee

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Future of the Last Leprosy Communities in China

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Like many other countries, China's leprosy control policy was to establish leprosy hospitals in remote areas. As a result, more than 1,000 such hospitals were built between the 1950's and 1970's. I was only 14 when I was admitted to the Qingyuan leprosy hospital in 1956 and it never occurred to me that this hospital would become my home forever and I would have to spend the rest of my life there. The land on which many once-remote leprosy villages are located has now become valuable as resort areas or parts of economic development zones. Many land developers have shown their interest in these locations and, as a result, many leprosy villages have been or are about to be relocated. In provinces like Guangdong and Guangxi, many people are concerned about being merged and relocated. The villages in Huadu, Nanhai, Qingyuan and Sanshui have been removed and the original sites have been converted to golf courses, automobile factories or are being developed by real estate. Some villages have seen their conditions improved through relocation, like safer housing and better transportation. Unfortunately, some villages have been forced to move to more isolated and inconvenient places. Though leprosy villages in economically backward areas have not been forced to move due to economic development, their living conditions have lagged behind because of social isolation. Many villages still have no water, no electricity, inadequate medication and healthcare, and poor transportation. In contrast to rapid economic development, the people affected by leprosy are facing the great challenge of being further marginalized. In Qingyuan, we have new houses equipped with kitchens and toilets. However, we were never consulted and were not asked for any suggestion about the design. As a result, though the new houses look good from outside, they are not suitable for us. The doors inside the house are not wide enough for wheelchairs. Squat toilets were installed, but most of our villagers with disability are not able to use them. Furthermore, the water heaters were changed from solar-powered to gas-powered, which has not only added to the villagers' financial burden, but also increased their safety concerns. The government has spent a huge amount of money on these new facilities, yet they have failed to solve our problems and meet our needs. I believe that four things should be seriously considered : 1. Consult and respect our opinions before shutting down any leprosy village. We were once forced to leave our own homes because of misunderstanding about leprosy. Now that society has become more open-minded, we don't want to be forced to leave our second home. 2. Preserve some villages. They are a witness to our history and bear educational value for future generations. 3. Consult and respect our opinions when helping us address our problems. We know our own difficulties and know best how to solve them. 4. What we urgently need is not safe and comfortable housing. Rather, we need social understanding and acceptance, as well as equal rights and opportunities.

Michihiro Koh
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In the 1950s, approximately 12,000 people were forced to live in the 13 national Hansen's Disease sanatoria in Japan. There are now 2,890 of us as of May 1st, 2007. The average age of the residents is 79, and about 200 people die every year. Most of the residents of the sanatoria have lived there for over 50 years. There are hardly any who consider leaving the sanatoria to live in community. There were absolutely no medical reasons for our forced segregation, and yet we were driven out of our hometowns. We were segregated and forced into remote national sanatoria. Family ties were cut, names were erased from census registers, and we were forced to live with false names. We had no freedom, we had no legal rights. We lived as mere shells of people. The HD sanatoria were places where the Japanese constitution had no influence. We used to say sarcastically that the sanatoria were managing the residents in such a way that we were neither alive nor dead. There are three walls affecting the future of the residents of the sanatoria. The first is the law. When the Leprosy Prevention Law was abolished, the new law stated that only those with HD and those who once had it would be allowed to live in the sanatoria, which means they cannot be shared by others. The second wall is discrimination. My niece has had a number of engagements broken off. The only reason is that she has an uncle who lives in a HD sanatorium. There are many family members of those affected by HD who cannot say "come home to us" because they are afraid of social discrimination. The third wall is the national policy. Due to a lack of funds, the nationally-run medical institutions have been transformed into independent administrative institutions. The government's position is that opening the national HD sanatoria to the public is absolutely impossible. A national association of residents of the 13 national sanatoria was formed in 1951 to work against repression by the authorities. Its purpose was to realise the basic concepts of the constitution of Japan in the sanatoria and to regain our human dignity. This struggle has continued for 56 long years. In our eyes, opening of the sanatoria to the local communities and their reintegration into society is the ultimate goal of our struggle. When this is achieved, then the sanatoria will finally be free from segregation and the residents will be freed from social isolation. Our hope is to submit a draft law in January. We collected the first one million signatures on 15th December. Nevertheless we know that more needs to be done, and we hope that everyone will give us a hand in this battle, so that the law will be enacted, and each sanatorium will be able to choose its own future.

Malavika Vartak
COHRE (The Centre on Housing Rights and Evictions)

The Centre on Housing Rights and Evictions (COHRE) is an independent, international, non governmental human rights organisation initially registered in the Netherlands and now based in Geneva, Switzerland. COHRE has registered offices in Australia, Brazil, Ghana, Cambodia and Sri Lanka. COHRE pursues the vision of a world in which everyone fully enjoys housing rights, and promotes practical legal and other solutions to endemic problems of homelessness, inadequate housing and living conditions, forced evictions and other violations of economic, social and cultural rights throughout the world. To this end, COHRE promotes the creative use and application of international human rights law. COHRE's presentation at the 17th International Leprosy Congress will focus on application of international human rights law in the context of forced evictions of persons affected by leprosy due to closure of sanatoria and other leprosy communities around the world. The presentation will therefore be aimed at strengthening the efforts of persons affected by leprosy to realise to their human right to adequate housing through the strategic use of international human rights law and the overarching human rights principles of equality and non-discrimination. Forced eviction is a violation of the human right to adequate housing. Beginning with the Universal Declaration on Human Rights 1948, the human right to adequate housing has been reaffirmed in numerous international human rights instruments. COHRE's presentation will highlight Article 11 (1) of the International Covenant on Economic, Social and Cultural Rights, that obliges State parties to respect, protect and fulfil the human right to adequate housing and thus provide protection from forced evictions. The presentation will also discuss in detail the UN Committee on Economic, Social and Cultural Rights' General Comment 7 (1997) on Forced Evictions. General Comment No. 7 lays down: "the State itself must refrain from forced evictions and ensure that the law is enforced against its agents or third parties who carry out forced evictions". Further, General Comment 7 asserts that prior to evictions, State parties must ensure that all feasible alternatives are explored in consultation with affected persons and that legal remedies must be provided to those affected by evictions. Additionally, it declares that evictions must not result in rendering people homeless and that State parties must provide alternative housing or access to productive land to all those affected by evictions. COHRE's presentation will also briefly touch upon General Comment 6 (1995) of the UN Committee on Economic, Social and Cultural Rights, which focuses on the economic, social and cultural rights of older persons. With regard to older persons and the right to adequate housing, General Comment 6 emphasises recommendations of the Vienna International Plan of Action on Aging particularly recommendation 19 that recognises that housing for the elderly, apart from physical, has particular psychological and social significance which should be taken into account and that national policies should help elderly persons to continue to live in their own homes as long as possible, through the restoration, development and improvement of homes.

Rosa Castalia Franca Ribeiro Soares

The Future of Leprosy Sanitaria Under Low Endemic Situation : The Philippines Experience

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The 8 leprosy sanitaria played a major role in the elimination of leprosy as a public health problem in the Philippines in 1998, with the successful implementation of Multiple Drug Therapy bringing about marked reduction in sanitarium registry, with old, disabled, poor, stigmatized patients remaining for custodial care. This development has paved the way to the conceptualization and implementation of expanding the role of the sanitaria with the view of maximizing the health staff available and the health care structure and services in the respective area of jurisdiction in support of the DOH thrust and programs. With leprosy being eliminated as a public health problem in the country and with only few old disabled people affected with leprosy being taken care in the sanitaria, the issues of cost effectiveness, efficiency and relevance of leprosy sanitaria under low endemic situation in the Philippines, is now put into questions, considering the economic condition and the many health priorities and emerging diseases that need to be addressed. How and what is the role and contribution of the 8 sanitaria in furtherance of the objectives of sustaining quality leprosy services and further reducing the leprosy burden would be a big boost to its relevance and existence.

Culion : A Mecca

Hilarion M Guia

IDEA Philippines

The promulgation of the Forced Segregation Law of the Philippines and the establishment of Culion island as a "National Reservation for People Sick of Leprosy" in 1906, brought about tremendous miseries and malady not only among the sick but also among their children who were fortunately born free of the disease. The repeal of the Forced Segregation Law in the mid-50's and later the discovery of the Multi Drug Therapy (MDT) inspired the people to crave a change in the status of Culion – to turn it from a leprosarium into a municipality with the status of self-governance. To achieve the desired conversion was, of course, not an easy task. Nevertheless, to hasten the realization of the noble dream, people thought of using a very powerful weapon.....Political Empowerment. The successful implementation of the MDT program contributed much in changing the perspective of the townspeople. Being no longer enslaved to the disease, there developed among them not just the aspiration but the courage to free themselves from the bondage and clutches of the spirit-paralyzing "Scourge". The residents of Culion radically ventured on a journey to regain their place "under the sun". They formed and organized a movement and started their way back to the mainstream of the society where they rightfully and lawfully belong as gregarious human beings. Equipped with high hopes and an indomitable spirit, the people of Culion advocated for reintegration into society and I was elected the first Mayor of the Municipality of Culion. The enactment of R.A. 7193 of 1992 was a real deathblow to the 86-year reign of the Department of Health over Culion. It was a resounding victory for Culion and its people, so to speak. Understandably, the good effects of the transformation could not be felt instantaneously. Nevertheless, the fear of being stigmatized, ostracized, discriminated and the like, has eventually eroded so that at this point in time, 12 years after since the Municipality became functional, the fear is on the verge of total obliteration. With the conversion of the Culion Leprosarium into a legitimate local government unit, the residents, regardless of status and condition in life, are made entitled and free to exercise and enjoy their constitutional rights and blessings under the principle that, "All Men Are Created Equal". Culion is now a blooming and thriving Municipality and residents are free of the stigma, discrimination and ostracism. Today, Culion is a Mecca!

Henry G Law

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In 2007, the final residents of Talsi Hospital in Latvia were told that they had one month to get themselves ready to be transferred to an infectious disease hospital in Riga. They felt despair over having to leave their home at Talsi and anxiety over concerns that the infectious disease hospital would force them out because they do not have an infectious disease. Shortly after the residents of Talsi were moved, some 10,000 people on the streets of New York City saw delegates from Lo Sheng Hospital in Taiwan and their supporters walk through the streets chanting "Guarding Lo Sheng. Preserve History, Preserve Dignity." Living on opposite sides of the world, the concerns of the residents of Talsi and Lo Sheng were the same – they simply asked to live out their lives in the place that had become their home. Hundreds of these communities exist around the world. Many people were forced into them long after a cure had been discovered because society's response to the disease was allowed to lag far behind the medical advances. Will we approach the final chapter in the lives of these thousands of individuals with a sense of justice and with a sense of responsibility and appreciation, or will we simply act as if they and their history never existed? Clearly our response will say a lot about us as a society. In the words of the late Les Parker, one of the last six residents of St. Giles Home in England: "It is essential that abandoned buildings don't result in abandoned lives, no matter how small our numbers may be."

Special Session : Animal Models

SPL-1

Immunological Perspective of Leprosy Using Transgenic and Knockout Mouse Models

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Leprosy is classified along a spectrum based on clinical and histopathological criteria. Toward the tuberculoid end of the spectrum, leprosy lesions feature strong cell mediated immunity and contain few acid fast bacilli, while at the lepromatous end of the spectrum cell mediated immunity is poorly developed and lesions contain numerous acid fast bacilli. Immunological mechanisms are believed to relegate a patient to a particular position on the spectrum and modulate upgrading and downgrading responses in the borderline areas. In this regard, associations have been made between tuberculoid leprosy and Th1-type responses and lepromatous leprosy and Th2-type responses; however, whether the cytokines present are the cause or an effect of the disease classification is poorly understood. The mouse model has contributed valuable information to our understanding of leprosy. Upon infection with *Mycobacterium leprae*, conventional, immunocompetent mice permit only limited growth of the bacilli and the histopathological changes are minor, both attributes of indeterminate leprosy. In contrast, athymic *nu/nu* mice show characteristics of lepromatous disease in that they allow tremendous growth of *M. leprae* and the infected foot pad tissue consists of heavily infected foamy macrophages. The development of genetically engineered mice, particularly those with defects in immune pathways important in host defense, has allowed investigation of discrete steps in the immune response, as well as their interactions, over the course of this chronic infection. The strains that we are studying represent impediments to both innate and acquired immunity and are considered important in the host response to intracellular pathogens at the level of both macrophage and T cell effector functions or in immunoregulation in the localized microenvironment of the granuloma (e.g., *NOS2^{-/-}*, *gp91^{phox-/-}*, *TNF^{-/-}*, *TNFR1^{-/-}*, *IL-12/23p40^{-/-}*, *IFNg^{-/-}*, *IL-10^{-/-}*, *CD4^{-/-}*, *CD8^{-/-}*, *nu/nu*). In addition, we are examining strains which carry mutations in genes which have recently been identified as major risk factors for leprosy (i.e. *LTA^{-/-}* and *PARK2^{-/-}*). Specifically, we are evaluating the disease which develops in various knockout mice upon foot pad infection with viable *M. leprae* using both the Shepard growth model and a modified Lepromin Test model. In addition, we are modifying disease in the appropriate knockout strains by treatment with immunomodifiers to create an additional knockout, and modifying established disease in the appropriate knockout strains by restoring the deleted function. We are monitoring bacterial growth, granuloma formation, cytokine and chemokine responses, and cellular infiltration, distribution and evolution. We are also using cells isolated from foot pad granulomas to construct *in vitro* granulomas. These studies have determined that certain knockout strains yield models of infection which can be classified along the leprosy spectrum. Other knockout strains, while not easily classified, exhibit thought-provoking phenotypes. We have found that administration of immunomodulators can induce a change in the disease presented in certain knockout strains, demonstrating that the *M. leprae*-induced mouse foot pad granuloma is a dynamic entity and has potential for determining the mechanisms underlying the instability of borderline leprosy. Furthermore, we have found that the cell profiles from the foot pad granuloma are quite distinct from the more easily assessable draining lymph nodes. Finally, cells isolated directly from the foot pad granuloma respond to *M. leprae* antigens *in vitro* and may yield insights into and support selection of specific antigens for use as diagnostic tools and vaccine candidates.

SPL-2**The Armadillo : A model Exhibiting the Full-Spectrum of Leprosy**

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The nine-banded armadillo, *Dasypus novemcinctus*, is uniquely susceptible to infection with *Mycobacterium leprae*, and has developed to be the host of choice for *in vivo* propagation of leprosy bacilli. The bulk quantities of *M. leprae* made available through armadillos has been a boon to leprosy research, but, like man, the specific factors that underlie their unique susceptibility to infection remain unclear. Though the majority of armadillos manifest lepromatous-type responses, some armadillos are wholly resistant to infection and others manifest borderline or tuberculoid-like responses when exposed to *M. leprae*. This full spectrum of immunological activity towards *M. leprae* recommends them as model hosts for translational studies to develop new diagnostic assays and anti-leprosy vaccines. Armadillos closely recapitulate leprosy as seen in man and they exhibit many of the same clinical problems of the infection. Paramount among these is extensive involvement of the peripheral nerves which can contribute to chronic ulcers in the extremities and other issues associated with insensitive limbs. Nerve conduction velocity testing is evolving as a means to index leprosy associated impairment in these animals, and armadillos are the most abundant source of leprotic neural fibers. Nine-banded armadillos in parts of the southern U.S. also are known to harbor a natural infection with *M. leprae*. It appears to have evolved by natural means and the disease is most common among armadillos in low-land habitats. Armadillos can support intense transmission of *M. leprae* in the wild, and incidence densities as high as 3.5 cases per 1000 animal days have been measured. More than 100,000 infected armadillos are estimated to range in Louisiana and Texas. However, the risks this sylvan infection presents to man and the total geographical extents of its range remain uncertain. Armadillos do not require specialized housing but can be incorporated into many existing animal facilities. Their long life span, cool body temperature and unusual reproductive cycle can recommend them for a variety of studies. The main factors limiting their use as laboratory models has been a paucity of specific biochemical or immunological reagents, and our inability to breed the animals in captivity. Recently, the Human Genome Consortium completed a 6X coverage sequence of the armadillo genome and has begun to annotate that sequence data in comparison to humans. This new genomic data is helping to make available a vast array of biochemical and immunological reagents and will likely facilitate more extensive use of armadillos in other research studies. Though 35 years has passed since armadillos were shown to be susceptible to *M. leprae* their importance as model hosts in the study of leprosy may be only just beginning.

SPL-3**Study of Pathomechanism/s of Nerve Damage in Leprosy Using Mouse Model**

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While screening drugs for antileprosy activity and testing for bacterial viability are the two most important practical applications of mouse model, in depth studies investigating the peripheral nerves in the experimental model are very few (Johnstone 1987). We summarize our contribution of past 25 years towards understanding of evolution and mechanism/s of nerve damage where the mouse model was used as an adjunct to human studies. The findings vindicate its role in deciphering of the sequence of events and mechanisms in leprous neuropathy. Structural and electrophysiological (NCV) changes were noted as early as 4 months in the sciatic nerves of Swiss white (S/W) mice injected in the foot pad with freshly harvested human derived *M. leprae* (5000 *M. leprae*/ foot pad). Primary involvement of 'C' fibres followed by atrophic changes in the axons, paranodal demyelination and segmental demyelination noted were similar to that seen in early human leprous nerve lesions (Jacobs et al 1987, Shetty et al 1988). In vitro NCV recording of the excised mouse nerves revealed absence of 'C' fibres potentials at 3 month and changes in A fibre potentials at 6th month demonstrating that the functional changes precede structural changes (Vidyasagar et al 1981). Blood nerve and perineurial barriers were intact up till 18 month post infection despite significant loss of fibers. However integral bacilli, its antigens and granulomatous reaction were conspicuously absent in the involved mouse nerves inoculated in the footpad with *M. leprae* (Shetty et al 1980). When freshly harvested *M. leprae* were directly injected in to the sciatic nerves of normal and immuno suppressed mice, tuberculoid and lepromatous type of neural granulomas were noted at 2 and 4 weeks time respectively. Two striking findings were a) lesion remained localized and b) *M. leprae* failed to enter the Schwann cells (Shetty and Antia 1999, 2002). **Model for characterization of *M. leprae*:** In order to determine whether *M. leprae* alone produced the typical change in the sciatic nerve of foot pad inoculated mice, a comparative study was undertaken using various other mycobacteria. Typical changes described above were seen only with *M. leprae* (Kamala et al 1984). **Effect of immunomodulation** using cyclosporine A, Thy 1.2, and T-200x5R model, on nerve lesion were also studied. Highlights of the findings were 1) The significance of non-T cell mediated antibacterial mechanisms 2) Metabolic interaction between *M. leprae* and host cell and 3) Dissociation between *M. leprae* growth in the foot pad and nerve damage (Shetty et al 1995). Recent and on going studies are aimed at bridging the gap between cause to effect relationship. Findings show that *M. leprae* mediated dephosphorylation lead to collapse of axon (atrophy) that result in ' paranodal and nodal demyelination (Shetty et al. 1999 Save et al 2004).

Special Session : Ocular Leprosy

SPL-4

Ocular Surface Disorders in Leprosy

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Leprosy is a well known of cause ocular morbidity, some of which could be potentially sight-threatening. The problems in the eye are exacerbated due to disabilities in the upper and lower limbs. It is important to identify ocular problems as soon as possible, and rectify them since; patients with anesthetic limbs need to have good eyesight to prevent further disabilities. A total of 57 patients, 46 males and 11 females were studied using 5 tests for detection of ocular surface disorders. Mean age (years) was 38 for males and 47 for females. Average duration of leprosy was 7 years and 90% were MB. 20% were on MDT. 80% of both males and females had normal visual acuity (6/6 to 6/18). 21% of the patients were on MDT. Ocular surface disorders were assessed through multiple methods and observations: Blink Rate, Sensation, OSD Schirmer I & II, OSD BUT, and Rose Bengal Stain. The tests were done for both eyes. The findings are described and correlated among the various tests. Consensus was studied in relation to demographic and leprosy characteristics of the patients, **Key words** : ocular surface disorders, ocular disorders in leprosy, eye involvement in leprosy.

SPL-5

Patients Presenting With Uveitis and Scleritis After Being Released From Treatment For Hansen's Disease

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34 patients who were released from treatment (RFT) for Hansen's disease have been undergoing treatment for uveitis and scleritis at The Leprosy Mission Kothara Community Hospital from 2000 to 2007. 94% of the patients had been treated for multibacillary type of Hansen's disease. 2 patients had uveitis and scleritis documented while under treatment which continued after RFT. In the remaining 32 patients eye disease occurred anywhere between 7 months to 30 years after RFT. 32% gave a definite history of similar eye disease while under treatment. 2 patients had concurrent lepra reactions with their eye complaints and 1 patient was detected as a relapsed case because of the eye disease and started on treatment. 73% of patients had been treated for more than 1 episode. 61 % were between 25 to 50 years of age and 65% had both eyes involved. This paper highlights the need for awareness among health workers providing care to persons cured of Hansen's disease that eye complications can occur repeatedly in certain persons after RFT that if left untreated may lead to permanent visual disability. **Key words** : visual outcomes, cataract surgery in leprosy.

SPL-6

Mycobacterium leprae In Newly Diagnosed Multibacillary Leprosy; Does Content Affect Evolution of Ocular Complications During and After Multi-Drug Therapy?

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Introduction : Ocular complications are known to occur more in multi-bacillary (MB) than in pauci-bacillary leprosy. **Purpose**: Does bacterial content at diagnosis affect magnitude and severity of ocular complications in MB patients? **Methodology** : A cohort of newly diagnosed MB patients, whose skin smears were recorded at diagnosis, were followed throughout 2 years of MDT and for five years thereafter with ocular examinations every 6 months. Evolution of various ocular complications were recorded and analyzed against bacterial content at diagnosis. **Results** : Beading corneal nerves during MDT were associated with smear bacterial index of 3.00+ or above (HR 4.218 95% CI 1.282, 13.877 p=0.018) and corneal opacities during MDT were observed less in patients who were smear positive (HR 0.379 95% CI 0.178, 0.804 p=0.011). In the years after completion of MDT, incident iris atrophy was associated with higher bacterial indices at diagnosis (HR 3.501 (95% CI 1.326, 9.245) p=0.011). Other leprosy and ocular characteristics were distributed equally among smear positive and smear negative patients. **Conclusion** : High bacterial content is associated with development of iris atrophy and beaded corneal nerves and possibly affords protection against immune mediated corneal opacities.

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Introduction : Lagophthalmos occurs in about 20% of all leprosy patients, both multibacillary and paucibacillary leprosy. The main complications of lagophthalmos are related to the incomplete closure of the eyelids and thereby to the continuous exposure of the eyes to exposure. It is essential to identify such morbidity early and treat promptly. **Methods :** A cross-sectional study of all leprosy patients with lid lag presenting at our hospital during 2007 was studied in detail. **Results :** Altogether 44 patients, 37 male and 7 female, were included so far. 5 were still on MDT, while a majority was RFT. There was only 1 PB. About a third had normal visual acuity, but 70% had lost corneal sensation, 23% had iridocyclitis, and nearly 50% had cataract. Nearly 60% had redness in the eye, for 80% it was irritable, 95% had watering of the eye, and 77% has exposure keratopathy. The analyses were done by various demographic and clinical details of leprosy, disabilities and the implications of these findings discussed. **Conclusion :** It is concluded that leprosy patients with lagophthalmos need constant and periodic eye check up to prevent ocular morbidity and further complications. **Key words :** lid lag in leprosy, ocular morbidity.

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585 eyes of 451 patients with Hansen's disease who underwent cataract surgery with intraocular lens implantation at TLM Kothara Community Hospital were followed up for a period of 1 to 3 years to observe the visual outcomes in the long term. The outcomes were graded 'good' (VA 6/6- 6/18), 'borderline' (VA 6/24 - 6/60) and 'poor' (VA <6/60- NPL). The study compared the visual outcomes in the following groups of patients 1) multibacillary 473 (MB) and paucibacillary 112 (PB) 2) bacterial index (BI) positive and negative at time of surgery 3) disease active (under Multi Drug Therapy) and inactive (Released From Treatment) at time of surgery 4) presence and absence of leprosy related complications at time of surgery (lepra reactions, ulcer) and 5) presence and absence of pre- existing leprosy related ocular disease (uveitis, scleritis, lagophthalmos). Overall long term visual outcomes were good in 73.3% of patients, borderline in 17.8% and poor in 8.9%. The study observed no appreciable difference in visual outcomes in the MB/PB groups. Groups with BI positive, active disease, leprosy related complications like reactions and ulcers, and leprosy related ocular disease had a slightly higher percentage of patients with poor visual outcomes than their comparison groups. **Key words :** visual outcomes, cataract surgery in leprosy.

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Patient records of 1175 eyes of 893 patients with Hansen's disease who underwent cataract surgery with intraocular lens implantation at TLM Kothara Community Hospital between 1995 and 2006 were examined to study the intra-operative and postoperative complications, their management and the visual outcomes for these eyes at last follow up. The study also sought to correlate the intra and post operative complications with certain disease specifics like bacterial index (BI) positive at time of surgery, disease active (under Multi drug therapy) at time of surgery, presence of leprosy related complications at time of surgery (lepra reactions, ulcer) and presence of pre- existing leprosy related ocular disease (uveitis, scleritis, lagophthalmos). 3.1% of eyes had intra-operative complications which were posterior capsular tear with or without vitreous loss. 20.9 % of eyes had post operative complications which were mainly posterior capsular opacification, post operative uveitis and pupillary capture of the optic of the intraocular lens. Eyes with intra-operative and postoperative complications had 24% and 17% respectively of poor post operative visual outcomes (VA < 6/60-NPL) at last follow up. **Key words :** operative complications, cataract surgery, leprosy.

Extracapsular Cataract Surgery and Intraocular Lens Implantation in Leprosy and Non-Leprosy Patients : Visual Outcome and Complications

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Aim : To compare the visual outcome and complications following ECCE cataract surgery and IOL implantation in a leprosy group to a group of non-leprosy patients. **Methods :** In this prospective longitudinal study 93 non-selected leprosy patients and 86 age-matched non-leprosy patients underwent ECCE cataract surgery during a 4-year period. Fisher's test was used for statistical analysis of visual outcome and complications records. **Results :** At least 2 months after each surgery we found in the leprosy group 64.5% of the eyes with best-corrected visual acuity e" 20/40, 23.7% with 20/60 to 20/100 and 11.8% d" 20/200. In the non-leprosy group the best-corrected visual acuity was e" 20/40 in 75.6% of the eyes, 20/60 to 20/100 in 16.3% and d" 20/200 in 8.1%. In the leprosy group the complications were: IOL dislocation (6.5%), IOL decentration (11.8%), inflammation and synechiae (15.1%), debris on IOL surface (19.4%), sphincter tears (30.1%) and capsular opacification (34.4%). In the non-leprosy group the complications were: IOL debris and IOL dislocation (1.2%), sphincter tears (2.3%), synechiae (5.8%) and capsular opacification (24.4%). **Conclusions :** Visual outcome in the leprosy group was similar to the non-leprosy group (p=0.273). Sphincter tears, IOL debris, inflammation, IOL decentration (p=0.0001) and synechiae (p=0.045) were significantly more frequent in the leprosy group compared to the non-leprosy group. **Key Words :** cataract surgery, ocular leprosy.

Phacoemulsification Cataract Surgery and Intraocular Lens Implantation in Leprosy and Non-Leprosy Patients : Visual Outcome and Complications

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Aim : To compare the visual outcome and complications following PHACO cataract surgery and IOL implantation in a leprosy group to a group of non-leprosy patients. **Methods:** In this prospective longitudinal study 60 non-selected leprosy patients and 60 age-matched non-leprosy patients underwent PHACO cataract surgery during a 3-year period. Fisher's test was used for statistical analysis of visual outcome and complications records. **Results :** At least 2 months after each surgery we found in the leprosy group 81.7% of the eyes with best-corrected visual acuity e" 20/40, 10.0% with 20/60 to 20/100 and 8.3% d" 20/200. In the non-leprosy group the best-corrected visual acuity was e" 20/40 in 81.7% of the eyes, 20/60 to 20/100 in 15.0% and d" 20/200 in 3.3%. In the leprosy group the complications were: IOL dislocation and inflammation (3.3%), debris on IOL surface (5.0%), IOL decentration (10.0%), capsular opacification and synechiae (16.7%) and sphincter tears (18.3%). In the non-leprosy group the complications were: synechiae, IOL debris, IOL decentration and sphincter tears (1.7%), inflammation (8.3%) and capsular opacification (13.3%). **Conclusions:** Visual outcome in the leprosy group was similar to the non-leprosy group (p=0.435). Synechiae (p=0.008) and sphincter tears (p=0.004) were significantly more frequent in the leprosy group compared to the non-leprosy group. **Key Words :** cataract surgery, ocular leprosy, IOL implantation

Visual Outcome of Intraocular Lens Implantation Surgery on Patients With Type II Reaction

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Introduction : patients with Type II Leprosy reaction on long-term steroids are at an increased risk of developing steroid induced cataract. Complicated cataract may also be seen due to iridocyclitis. We sought to determine the visual outcome of leprosy patients with cataract who had been on long-term steroids and thalidomide therapy for type II reaction. **Methods :** 23 eyes of leprosy patients with type II reaction and on long term steroids with thalidomide which were operated of cataract from 2003-2007 were studied. The same technique (ECCE with PCIOL implantation) was employed in all patients and the parameters studied were BI, duration and dose of prednisolone, and associated thalidomide therapy. The visual outcomes were recorded at 1st postoperative day, then at 2 weeks and finally at 6 to 8 weeks. **Results :** Among the 23 eyes which were taken in this study, 21 eyes (91%) had good visual outcome (VA 6/6 – 6/18), 1 (4.5%) eye had borderline visual outcome VA 6/24 – 6/18), 1 (4.5%) eye had poor visual outcome (VA < 6/60). One eye developed severe postoperative iridocyclitis. No postoperative infection was seen in any patient. **Conclusion :** Neither BI, nor the duration or dose of prednisolone, or additional thalidomide therapy had any effect on the visual outcomes of these patients. Intraocular lens implant surgery can be safely done in leprosy patients with type II reaction on high dose steroids with thalidomide. **Key words :** intraocular lens, type II reaction.

Profile of Patients with Hansen's Disease Who Underwent Cataract Surgery at Kothara Community Hospital

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Patient records of 893 patients (1175 eyes) with Hansen's disease who underwent cataract surgery with intraocular lens implantation at TLM Kothara Community Hospital between 1995 and 2006 were examined to study the profile of persons who came to the hospital for cataract surgery. Patients' profile was based on age groups, gender, occupation, disease type and classification, treatment status, leprosy related complications, etiology of cataract, associated eye disease and pre operative visual acuity. The study also sought to determine factors that might influence acceptance for cataract surgery in a hospital situation. 62.4% of patients were males, 87% of patients were 50 years and above and 34.2% of patients were coming for surgery on the second eye. Patients under treatment for leprosy or its related complications at the hospital had their surgery at an earlier stage (before severe visual impairment) than those who were not under direct medical care. This was due to earlier examination, diagnosis and surgery due the availability of ophthalmic services at the same hospital. **Key words:** cataract surgery, leprosy.

Loss of Facial Sensation in Leprous and Non-Leprous Women

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Purpose was to ascertain the number of leprosy and non-leprosy women developing loss of facial sensation following treatment for leprosy in a cohort study (1975-2003). 79 leprosy women: LL (24), BL (27) and BT (28) and 18 non-leprosy women (NL) had facial graded sensory skin test (FaSTG) using Semmes-Weinstein monofilaments. 12 areas, innervated by different nerves, were tested on each side. Subjects living in an area with low leprosy endemicity could all feel the 0.05 g filament, the lowest value used and this was considered upper limit of normal. Sensory loss was graded mild (0.2-4.0 g), moderate (10-20 g) and severe (50-300g). 43/79 women with leprosy had impaired FaSTG: LL (63%), BL (59%) and BT (43%) while NL had 17%. Involvement of the ophthalmic division was: LL (58%), BL (56%), BT (43%) and NL (17%). Loss of FaSTG and other leprosy damage in NL was associated with new leprosy. The degree of sensory loss was highest in BL. Three women with BL or LL were blind and a fourth had corneal ulceration. This study highlights the need to test "cured" leprosy patients and family contacts to detect sensory loss and minimise late eye damage. **Keywords:** Leprosy, women, facial sensation, Ethiopia

Epidemiological Survey on Uvea Disease in Leprosy

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Objective: To determine the prevalence and characteristics of the uvea disease in leprosy. **Method:** One thousand and forty-five cured and active cases of leprosy in Taixing, Jiangsu were checked by specially trained ophthalmologists. **Results:** Uvea disease caused by direct invasion of *M. leprae*, type-a1 reaction, and secondary corneal disorders were found in 7.85% of the all investigated cases. The prevalence rate of the disease was found significantly higher in active cases (25%), multi-bacillary cases (24.27%) and those with long duration of the disease (38.93%). It was characterized by granulomatous iridocyclitis, with presenting of redness of the ciliary body (14.73%), irregular pupil (48.06%), diminished light reaction (45.74%), irispstterior synechiae (35.66%), small pupil (28.68%), blocked pupil (19.38%), synechia iridis anterior (17.83%), shrivel uvea (17.05%), depigmentation (15.5%), and iridoleptynsis (14.73%). Secondary cataract was found in 81.54% of those with chronic iridocyclitis, of which 60% of reduced vision, 40.24% blindness, and 52.73% curable blindness. **Conclusion:** The uvea disease in leprosy could be caused either by direct invasion of the *M. leprae*, type-a1 reaction. It was commonly found in active cases, multi-bacillary cases and those with long duration of the disease. The clinical characteristic is granulomatous iridocyclitis, and most of them develop cataract and loss of vision. **Keywords:** leprosy; uvea disease.

Long-Term Results of Temporalis Muscle Transfer in Correction of Paralytic Lagophthalmos

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Objective : To compare the long-term results and possible complications of a modified temporalis muscle transfer (TMT) with the Johnson's procedure in correction of paralytic lagophthalmos. **Methods :** From September 1996 to March 2002, paralytic lagophthalmos due to leprosy in 167 patients were corrected with TMT. The 139 cases (201 eyes including 77 unilateral and 62 bilateral) followed up 5 years after operation were analyzed. There were 89 males and 50 females with ages ranging from 18 to 67 years (54 years on average). The duration of lagophthalmos was 1.5-22.5 years with an average of 8.7 years. And 76 eyes were complicated with lower eyelid ectropion. 109 eyes were corrected with Johnson's procedure (Johnson's TMT group), 92 with the modified TMT procedure (modified TMT group). The modifications were as follows: *Omitting the fascial strip in the lower eyelid to avoid postoperative ectropion. a)fixing the fascial strip of the upper eyelid to the middle or inner margin of the tarsal plate depending on the degree of the lagophthalmos to avoid possible ptosis of the upper eyelid. **Results :** In Johnson's TMT group, the mean lid gap on light closure was reduced to 3 mm postoperatively from 8 mm preoperatively; and the mean lid gap on tight closure was reduced to 0.5 mm postoperatively from 6 mm preoperatively. The symptoms of redness (75.7%) and tearing (65.3%) disappeared or were improved postoperatively. However, ectropion and ptosis occurred in 44 eyes and 19 eyes respectively. The overall excellent and good rate was 57.8%. In the modified TMT group, the mean lid gap on light closure was reduced to 3 mm postoperatively from 9 mm preoperatively; and the mean lid gap on tight closure was reduced to 0.5 mm postoperatively from 7 mm preoperatively. The symptoms of redness (91%) and tearing (72%) disappeared or were improved postoperatively, and no ectropion or ptosis was found except three ectropion. The overall excellent and good rate was 87.5%, which was significantly higher than that of Johnson's group ($P < 0.01$). **Conclusion :** The modified TMT is an efficiency and simple procedure with very few complications, and thus is strongly recommended for use when TMT is an indication. **Keywords:** temporalis muscle transfer; lagophthalmos; leprosy.

Corrective Surgery for 25 Lagophthalmos Case in 23 Patients at a Stretch in Camp at RLTRI, Raipur in March 2005

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Introduction : Blindness is a common and disastrous complication of Leprosy. Coming on top of anaesthesia of hand and feet it is nothing less than a calamity. The procedure commonly used in surgical management of Lagophthalmos provides active correction of eyelid paralysis. We have used Johnson's procedure (modified by Dr. Vijay Kumar). In this procedure the grafted tendon passes in the upper lid along the upper margin of eyeball so that the tendon lies just above the tarsal plate. In an attempted closure of the eye lid the tendon/strip pushes the tarsal plate and the lid down like a shutter to close the eye. **Material And Method :** In the month of March 2005, RLTRI, Raipur conducted a camp for corrective surgery in Lagophthalmos cases. Out of 30 cases registered, 25 cases (two bilateral cases) in 23 patients were selected for surgery. These cases were operated simultaneously in two days. This is supposed to be the largest number of lagophthalmos cases operated in a single camp. Out of 25 cases majority were in the age group of 20 years to 40 years. The average duration of the lagophthalmos was 3 years. Two cases were above the age of 50 years and two young adults had bilateral lagophthalmos. Evaluation of operated cases of lagophthalmos was done by measuring the lid gap. The average lid gap in these patients was 8 mm. The maximum lid gap recorded was 10 mm. The palmaris longus graft was used in 21 cases and Tensor fascialata graft was used in 4 cases. The postoperative lid gap was measured at one-year follow up. In 23 cases the lid gap was zero and in 2 cases lid gap of 1 mm and 2 mm was seen. **Conclusion :** The aim of using Johnson's method (modified by Dr. Vijay Kumar) is to provide a better eyelid closing mechanism. This method takes less operative time; therefore it is suitable for the camps. The 25 corrective procedures in 23 patients for lagophthalmos in a stretch are supposed to be the largest number of cases during any RCS camp.

Special Session : History of Leprosy

SPL-18

The Acworth Leprosy Museum, Mumbai

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In anticipation of "A World Without Leprosy", this paper focuses on a project to set up a Museum on the History of Leprosy in India. The idea was mooted by the late Sharad Naik in 1999, and is bearing fruit as a joint project of the Acworth Leprosy Hospital and the Research Society with major financial support from the Sasakawa Memorial Health Foundation. Its two main objectives are: education/information of the public and provision for research into the multifarious histories of the disease. The Museum is fittingly housed in an old ward, and surrounded by a medicinal garden of leprosy remedies mentioned in Ayurveda. The "Homeless [later Acworth] Leper Asylum" established in 1890 is integral to Mumbai's history, embodying affluent urban society's interactions with a category of marginalized people. Special displays highlight its establishment, early years and subsequent history from the social, legal and medical angles. Other major displays centre on (1) The Disease; (2) Treatments; (3) Documentary material; (4) Public perceptions; (5) Philanthropic Efforts for and by Leprosy Sufferers; (6) Legal Aspects; (7) Public Policy. In order to promote historical research the Museum houses a substantial collection of copies of leprosy documents, reports etc., dating from the nineteenth century colonial period to modern times, obtained from the Maharashtra, Rajasthan, Andhra Pradesh and Tamil Nadu State archives. A warm welcome awaits interested persons.

SPL-19

The Emergence of the International Leprosy Association

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Objectives : 1. Emergence of the International Leprosy Association **Methodology :** Archival research, League of Nations Archives, Geneva **Results :** 3. This paper describes the international collaboration that grew out of the Berlin (1897), Bergen (1909), Strasbourg (1923) and Cairo (1938), culminating in the formation of the International Leprosy Association. It will focus particularly on the request from the Third International Leprosy Conference in Strasbourg (1923) that the League of Nations constitute an international bureau of information and inquiry regarding leprosy and renew the publication of « Lepra », the International Archives of Leprosy. It will then discuss the subsequent League of Nations Inquiry into Leprosy, the Bangkok meeting, in December 1930, and the Manila Conference, in January 1931, from which emerged the International Leprosy Association and the Cairo Congress, in 1938. Using reports, photographs, and leprosaria plans gathered by the League of Nations Inquiry, it will describe the leprosy work throughout the world, at this time. 4. This study will provide an historical perspective on the aspirations of the 2008 Hyderabad Congress: "A World without Leprosy". **Keywords :** League of Nations, International Congresses, International Leprosy Association.

SPL-20

Metamorphosis of Hand Reconstruction in HD

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Reconstructive surgery on deformed hands in Leprosy disabled originated in the Christian Medical College Hospital Vellore, India in 1948 and was pioneered by Dr Paul Wilson Brand. It stands as one of the greatest contributions in the Annals of Surgery of the 20th Century to alleviate disability and restore dignity through social integration. Its ongoing metamorphosis, still largely indigenous, is serving the purpose of the changing demands of function and the socio-economic situation. Would rehabilitation preceeding reconstruction, which has fast gained acceptance, see the need for : 1. abandoning or greatly minimising complex surgical corrections altogether 2. compelling the practice of preventing deformities 3. the intermittent use of light weight and user friendly hand orthosis ? The author presents the historical directions that were once taken indigenously and what changes that can be taken to preserve the deformed hand.

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This case is based on my first-hand experience and participation in the closure of a leprosy home in Madhya Pradesh. None of us who participated in the act were aware that our participation would lead to what I consider such a momentous event – the first one perhaps in the country. When I last visited Sihor, little did I think that the events of that visit would take a permanent place in my vivid memory. Sihor is a village about 35 km away from Bhopal, the capital of Madhya Pradesh. Through my association with Danlep, a group dedicated towards the rehabilitation of leprosy patients in Madhya Pradesh, I was very closely working on the issue of leprosy. It was a pleasant summer evening when I arrived at the Home and Hospital in Sihor. I found out from some men sitting under a tree that there were women patients as well, who were placed in a different ward. I wanted to meet the women as well. The men and women, I found, always maintained a distance from each other. Although they stayed in the same institution, their spaces were clearly demarcated. Seeing me approach the female ward, one woman sitting at the door suddenly rose and started to go inside muttering about her ill health. The sudden presence of a stranger might have intimidated her. I saw another woman sitting a little away. She was about 35, rather too lean, with hunched shoulders and downcast eyes. She was absent minded drawing patterns on the floor. Without so much of an upward glance she explained that Kamala's mental condition was not very good and that is why she sometimes doesn't realise what she does. I asked her what her name was. "Murti. Murti Bai", she replied, eyes still following the patterns she made on the floor. And then silence. That was when I first met Murti Bai – withdrawn, emotionless and an epitome of dejection. I could not help but think about this woman. She seemed to be sick, yet strangely willing to live on. She refused to make eye contact. I asked her what she was doing. This time she looked up exasperatedly. "If I do not keep myself occupied some how, any how, I'll lose my sanity like Kamala!" she cried out. The sudden outburst opened up a window into her life. The eerie silence in this place was eating her away. She would get a chance to talk only when the doctor came to dress her wounds. Otherwise everything was dead silent. I returned to the hospital after three days. On enquiring about her family, Murti broke into a deep sob and cried for a long time uncontrollably. Between sobs she answered that she had a big happy family. When she was asked to leave the village and go away, she had to leave behind her youngest child who was only eight months old then. When she calmed down a bit, I asked her how she came to be in this hospital. "It's all a matter of fate," she said, more to herself than to me. These were touchy questions, but I went on. I asked her since when she was suffering from the 'disease'. She had observed some discoloration on her skin but did not think much of it. Since it was not interfering with her work, her family did not bother about it, either. After a while the villagers began to talk about it openly. Suddenly everybody started to keep away from her. The entire village feared that she might spread the disease to the others. The Patel was an influential man in the village and nobody dare disagreed with anything he said. Three days later, Murti Bai's father in law was called at the village gathering. Everybody vehemently declared that she be sent out of the village. Didn't she say anything at all? To this, "the damn incurable disease!" came out with all the pent up frustration. I was taken aback at the amount of suppressed stigma. When I recovered after a moment, I explained that leprosy was no different from any other physical ailment. People are unaware, and that is why they understand leprosy as a contagious, horrifying disease. After these first few interactions, I was convinced that she is a survivor and has enough motivation to fight back. With a little support, she can get back to her normal life. My mind started racing. If Murti's family and the other villagers can be convinced that leprosy is not an evil and that there are other victims who stay with their families, there might be a ray of hope after all. I got the support of several local self help groups that contributed actively towards concretizing the need to generate awareness among people about leprosy. The next task ahead of us was to educate the villagers and make them aware that leprosy is curable and not a disease bigger than life itself! It was the villagers' ignorance that proved to be the biggest evil for Murti Bai. Something that had started off as a small effort that I initiated, now turned into a campaign. The objective of this campaign was to take Murti Bai back to her family and spread awareness among the people in the village. It was not me who was driving the campaign any more. My role was that of a connecting link that brought several people together for a common cause. On arriving at Surajpura, we gathered some preliminary information about the village head and some other prominent figures. We were told that the Patel of the village, Daulat Ram was the most affluent and influential power head. We could no longer contain our curiosity and asked them where the Harijan community lived in the village. We found the place and reached Murti Bai's husband, Failiram's house. We found several mats and other household cane things outside the house. The other women in the group began interacting with him, enquiring the prices of the cane things and slowly shifted to asking about the family and how many people stayed in the house. I think this is where our tact faltered. The seemingly unknowing villagers figured out that this had to do something with Murti Bai. After a little while a small clump of people had gathered in front of Failiram's house - Murti Bai's parents in law, all her children, veil clad women from the neighboring houses, the preachy elders, the contemplating educated youth, the giggling young girls, the curious children and the randomly gathered people waiting for some theatrics. When asked why Murti was sent away, nobody dare mentioned the word 'leprosy'. They brushed the question away saying it was a big dangerous disease that Murti was suffering from. I wondered if avoiding naming the disease was a mark of respect for the victim or an

unbearable embarrassment. Probably it was ignorance as well. They kept referring to it as the numbing disease. We shifted tack and began asking questions about why Murti was not kept in the village. The Patel replied to this firmly saying that that nobody else was afflicted with the 'deadly' disease. Coming to more questions, we asked if anybody else in Murti's family was suffering from leprosy. No, there was nobody. Then how come Murti was infected with a contagious disease? We moved on to find out from Failram about when he last met his wife. Failram looked embarrassed and it seemed like he met her clandestinely. He admitted that he visited her once in a while and that they were still sexually involved. Then where was the question of the disease being contagious? Everybody looked at each other with surprise written clearly on their faces. After the first wave of astonishment had passed, they began talking among themselves. Surprise gave way to inquisitiveness. Now they wanted to know more about leprosy and its treatment. They looked to us for more information to add to their limited knowledge. The leprosy worker from our group Shukla ji patiently explained all about the causes, symptoms and cure of leprosy. The Patel announced that Failram should go and bring back Murti. Our efforts seemed to bear fruit sooner than I had imagined. A sudden paradigm shift with the Patel was the last thing we had expected. Further, it was agreed that nobody would discriminate against Murti ever again. The villagers were so deeply occupied in their discussions that we now became mere spectators. It was no longer required for us to facilitate the talks. The Patel finally spoke over everyone else and agreed to give Murti's father in law a joint consent in writing. It was really an atmosphere of emotional repenting. After a few days, Failram along with the Patel and a few other village elders went to Sihor to get Murti back to Surajpura. I'm sure to remember that day as the second home coming of Murti. Her rightful place amongst her family was finally restored. That day, Surajpura wore a real festive look, since the daughter in law of the village was once again brought in like the bride as she had come from her parents' house twenty one years ago.

SPL-22

Centenary Year of Dr Stanley Browne, (Mr Leprosy)

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Introduction : Dr Stanley Browne would have been 100 years old today. He was born 8 December 1908 and died 29 January 1986. His wife Mali died on 29 January 2006. Both died on World Leprosy Day. The date overlaps this ILA conference. Stanley Browne from the age of 5 wanted to be a medical missionary. After a difficult childhood he entered medical school at Kings London gaining most of the medial prizes. In 1934 soon after qualifying he was appointed to Yakusu, a Baptist Missionary Society Hospital in the former Belgian Congo. His epidemiological research identified an area around Yakusu with the highest incidence of Leprosy in the world. Chaulmoogra oil was the standard treatment at that time until the arrival of Dapsone in 1946. His main interest now was the control and treatment of Leprosy. He and his colleagues set up the Yalisombo leprosarium and kept detailed notes of patients now treated successfully for leprosy. In 1958 he was appointed Senior Leprosy Research Specialist at Uzuakoli in Nigeria and succeeded Dr Frank Davey. He researched several new drugs. In 1955 his research on B663 known as Clofazamine is still used in Multidose Leprosy treatment. In 1966 he succeeded Dr Robert Cochrane as director of the Leprosy Study in London. Dr Browne advised over 60 countries on their Leprosy Control programmes and in 1982 initiated the integration of Leprosy into General Medical Services. He was keen on countries reducing the social stigma of Leprosy. He was on the ILA board as secretary and later secretary/treasurer, and organised 5 International Leprosy Congress meetings.

SPL-23

Leprosy in the Time of Dyarchy : Ernest Muir's 'Propaganda, Treatment, Survey' Scheme, India 1925-1935

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The 'Propaganda-Treatment-Survey' (PTS) scheme which dominated public policy in leprosy in late colonial India was the brainchild of Ernest Muir (1880-1974); it functioned through the Indian Council of the British Empire Leprosy Relief Association (ICBELRA). The period of Muir's leadership of PTS (1925-1935) coincided with "dyarchy", a political landmark in India's freedom struggle, when administrative authority in some subjects (such as health) devolved to elected provincial governments. It was the backdrop to the interactions between the new administrative set up and the quasi-governmental ICBELRA. The paper locates the PTS strategy which was based on out-patient clinics, early detection through contact examination and 'propaganda', in the anti-tuberculosis work of Robert Philip of Edinburgh in the early twentieth century. But unlike tuberculosis which was then incurable, PTS also drew on the claimed efficacy of derivatives of chaulmoogra-hydnocarpus oil. ICBELRA Health Education posters show that Muir's indebtedness to tuberculosis extended beyond strategy to biases about leprosy predilection, transmission and prevention. Although apparently well thought out, Muir's scheme failed to make an impact. The reasons proposed are: failure of the therapy, poor cooperation from provincial governments, and studied aloofness of the imperial government. Nevertheless PTS was the (unacknowledged) precedent for independent India's strategy in its National Leprosy Control Programme.

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The present historical study concentrates on the discussions about leprosy emerging in the Russian Baltic Provinces (historic Kurland, Livland and Estland, modern Latvia and Estonia) at the end of the 19th century. In 1896 from these territories the disease had entered Germany, triggering a series of events that culminated in the First International Congress on Leprosy (1897) in Berlin. By this time the social, economic, medical, political conditions in which the disease flourished had already been operating for more than a decade. In these conditions, medical matters were entangled with the local social and political conflict which had three participants: Estonian and Latvian indigenous populations, German-speaking upper levels and the Russian central authorities. The arguments on the origin of the disease, fate of the sick, and the question whether the disease symbolised the degeneration of the local population created an atmosphere of leprophobia, (remembered even nowadays.). **Key words :** history of leprosy, Baltic states, Russian Empire, political reception of leprosy

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The present study aims to examine the relationship between the Brazilian state and public health in the first half of the twentieth century, having as joint question the politics of obligatory isolation of the carrying patients of leprosy and the reactions to the same one. The theoretical instrumental chosen can be summarized through the definitions of State and *bureaucratic field* developed by Bourdieu, P. coercion and consensus from the indications of Antonio Gramsci A and developments of Godelier M. The documentary *corpus* of this work consists of oral sources, interviews from the research project "Memories and history of Hansen's disease in Brazil. From these theoretical assumptions, we found in the documentation rather than mere acceptance of state policies that are violent (the compulsory isolation), but the operation of mechanisms that by the naturalization of such practices, creates and maintains a popular demand for these types of domination and imposition. The construction of the state is only possible through their naturalization undertaken by physical and symbolic coercion. However, the acceptance (or even demand) required for the establishment and reproduction of state power can only be built and distributed by consensus. Leprosy; Health Public Policy; Patient Isolation; State.

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For over 3,000 years, the thoughts of persons affected by leprosy have remained a "secret" just like their lives have become a secret once a diagnosis of HD has been confirmed. Through this process of secrecy, many persons with HD have been abandoned by their loved ones, their existence erased from the community registry, their dreams become nightmares, and their footprints blown away by the wind of ignorance as their bodies or ashes have not been returned to families. In the 21st century, many of us have an opportunity to record the words, thoughts, and feelings of persons affected by leprosy. This presentation will show how oral histories conducted at the Ukraine National Leprosarium in Kutschergan Village, Ukraine, the Sanatorio San Francisco de Borja-Fontilles in Alicante Spain, and what was previously known as the United States Public Health Services Hospital in Carville, Louisiana have assisted with the restoration of dignity to those interviewed, and will help to dispel HD related myths among those who will listen to or read their stories. The stories shared by brothers and sisters from three countries and separated by thousands of miles are bonded in similarities....physical and emotional pain, lost dreams, love, hope, creativity.

The Museum Experience : Documenting and Retelling the Social History of Leprosy in Norway

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This paper discusses the importance of historical documentation and leprosy site preservation today, seen through the experience of the Leprosy Museum in Bergen, Norway. In a time when the world is looking forward to a total eradication of leprosy, social history issues are important, but the sources are fragile. The Leprosy Museum and the Bergen Leprosy Archives have been working successfully to document and display the social history and personal narratives of Norwegians who have suffered from the disease. Seen through the experiences and exhibitions at the Leprosy Museum, the paper discusses the importance of public access to the history of leprosy, many decades after the disease itself disappeared from the Norwegian society. The study is based on the experience from developing the museum and its exhibitions, and from participating in larger museum-archival co-operations. The paper concludes that leprosy continues to be a social issue for several generations after the disease has ceased to be a problem in its actual society. Leprosy museums and archives may play an important part when people trace the lives of their relatives, often silenced by earlier generations. This requires, however, well-reflected methods of museum display and archival work. **Key words** : Museum, history, social aspects, stigma.

Tracing the Stigma in Historical Texts : Norwegian Examples 1850-1920

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Through selected readings of texts on leprosy from 19th and early 20th century Norway, this paper discusses how modern cultural historians can contribute to the understanding of leprosy and stigma. Within the modern field of cultural history, several studies have argued that stigma and leprophobia should not only be understood as a result of religious or social traditions, but also as a result of political conditions, such as imperialism, colonialism, missionary activities, and racism. Based on methodology from critical cultural theory, this work also studies the relationship between the scientific leprosy research and public health work in Norway in the late 19th century, and highly profiled Norwegian leprosy missions in Madagascar during the same period. The study is based on Norwegian texts on leprosy, written for both medical and religious audiences, from 1850-1920. The paper argues that critical cultural theory provides valuable insight into the history of the stigma, also in a country like Norway, and that medical and religious leprosy discourse more often should be investigated as a whole. The study reveals an interplay in which medical as well as missionary men, often caught in ambiguous positions, developed metaphors which loaded the disease with subtext contributing to the stigma. **Key words** : Stigma, social aspects.

The Islam View About Primary Prevention of Leprosy

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Introduction : Medical sciences have a specific situation in human sciences because it is related to body and mind. Islam is one of the divine religions and as a complete religion has many useful guidelines about different domains of medical sciences that can help us to health promotion. This research aims to obtain Infallibles sayings about primary prevention of leprosy. **Material and Methods** : Data gathering was done from more than 4000 religious books such as Jameo'ol Ahadith Shia, Osool'e Kafi, Behar'ol Anvar, Vasayel'oshia and Mostadrak'ol Vasayel. **Results** : Data analysis showed numerous quotations about primary prevention of leprosy. Some of cases consist of using leek, beetroot, turnip, wild rue, ocimum album, oleaster (sorb), to begin & end meal with salt and not consume garden cress, the glands of meat and vessels. Personal health for example tooth brushing were recommended too. Also there were sayings about isolating patients suffering from leprosy. **Conclusion** : The results express the view of Islam with respect to medicine. It is a hope that humans greatly benefit from this valuable and virtuous treasure. More researches are needed for more results & prescription. **Keywords** : Leprosy, Primary prevention, Islam.

Osamu Usami

The Imperial Bequest Hall, built for the purpose of training the leaders for the planned leprosy sanatorium where, during the WWII, one million patients from all over Asia were to be isolated in the Hainan Island in southern China. But this purpose was lost and in 1949 it was renamed 'Imperial Bequest Memorial Museum'. The museum which had lost its original purpose was turned into an exhibition hall for the photographs of people who had contributed toward the establishment of Nagashima Aisenen Sanatorium and other objects such as a big jar, a gift from the Empress dowager, and the patient children's artworks. On the other hand, important material that would testify the inexplicable hardships experience by the people in sanatorium those days were lost to repeated fire and rebuilding of the sanatorium facilities. Patients those days had to endure extreme poverty in addition to their physical problems with their hands, feet and eyes. In order to manage their lives they have created various tools and devises but these had all been lost. Under these circumstances I have decided to record the history of misery not just by writing but by "artifacts" and began preserving them. No one understood my thoughts. The residents and sanatoria officers alike, they all looked at me with disdain as if I were a beggar. I consider it is my mission to testify what had taken place under the notorious Leprosy Prevention Law. I consider this a negative legacy that has to be recorded in history so that the history will not repeat this misery and violation of human rights in future.

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Leprosy in Spain is dated to the Phoenician ages and lately to the colonization of Roma during six centuries from the east to the west of Spain by troops from the Medium Orient and then by the Arabic invasion during eight centuries in Valencia, Murcia, Andalusia and Extremadura, where there were scientific publications by Arabic Doctors who wrote about Leprosy. Another way of penetration were the religious peregrinations to Santiago de Compostela located in the north of Spain getting founded "lazaretos" (leproseries), being less important the Jews exodus and the crusades. After the reconquest to the Arabs, a lot of Leproseries were founded in Sevilla, Valencia, Granada, Mallorca and Islas Canarias, being important the help and interest by the Catholic Kings and Doctors such like Arnau de Vilanova. From the year 1492 a lot of Spanish spread out the Leprosy in America because most of the soldiers came from endemic areas. In the 19th century increases the Leprosy in Spain publishing the first statistic in 1851 with 284 cases and Benito Hernando published in 1881 "Lepra en Granada" being visited by Virchow and Neisser. The enemy still increased and in 1909 and Fontilles sanatorium was inaugurated in the province of Alicante for the big amount of patients in that region. In 1944 sulphones were applied being the total number of patients 1518 being begun a Sanitary campaign by the Dermatologist and mobile teams by the initial detection being discovered 300 new cases every several year which got in 1970 6000 patients. From 1948 were started in Fontilles International courses of Leprosy for Doctors, Missionaries and to paramedical workers being organised over 100 editions. In 1970 there was a decrease of the prevalence and incidence, multidrug therapy was applied and in the 2006 the total number of cases were 60 in control and 14 new cases with 10 of them were in immigrants. The Leprosy has been eliminated in Spain because of the important work of Fontilles in this aspect by his assistential labour, research and formation.

Special Session : SALSA

SPL-32

Application of The SALSA Scale for Screening of Activity Limitation and Safety Awareness

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The SALSA scale has been developed through collaboration of occupational therapists and others based on data collected in five countries around the world (Disability and Rehabilitation, 2007; 29: 689 – 700). The SALSA score, which can range from 0-80 points, can be used to quantify levels of activity limitation in a target group, to compare populations or document improvements after intervention. General health or rehabilitation workers can use SALSA to screen clients and refer those with high scores to specialised services. SALSA indicates the types of activity limitation experienced by the respondent and thus assists therapists in designing appropriate interventions. SALSA has already been used in leprosy settlements (India, Nepal, China), in hospital outpatients (India, Israel) and in disability surveys (Indonesia). A study of the long-term impact of reconstructive surgery on functioning is now underway in NW Bangladesh and SALSA is one of the measures used. Similar studies have been planned in India. SALSA has good internal consistency and discriminates between people affected by leprosy and unaffected controls. Its validity is based on comparison to independent expert assessments of activity limitation. More could be done to compare SALSA scores to other known measures of functioning e.g. FIM, DASH, WHODAS and the standardised assessments used before and after reconstructive surgery. A study of test-retest reliability has been conducted in Nigeria with good results but this should be reproduced in other populations. Interviewers require two days of training to be able to use the scale effectively. Translation of SALSA requires careful verification through back-translation. Translations are now available in French, Brazilian Portuguese, Hindi, Bengali (Kolkata), Bengali (Bangladesh), Nepali, Tamil, Mandarin, Hausa, Yoruba, Hebrew, Bahasa Indonesia. **Conclusion** : As more experienced is gained and documented, the practical value of SALSA is becoming clear encouraging more workers to use it.

SPL-33

Test-Retest Reliability of the Screening of Activity Limitation and Safety Awareness (SALSA) Scale in North-West Nigeria

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Introduction : The study examines the inter-tester and intra-tester reliability of the recently developed scale for Screening of the Activity Limitation and Safety Awareness (SALSA) in North-West Nigeria. The scale was developed through collaborative research in 5 countries around the world. **Methodology** : 103 people affected by leprosy from 3 states in North-West Nigeria participated in the study. A Hausa translation of the 20-item SALSA questionnaire was used by trained health staff to interview the participants. Each participant was interviewed twice. 75 people were interviewed by two different interviewers; the second interview was carried out 4 - 76 days after the first interview. 28 people were interviewed by the same interviewer on two different occasions; the second interview was carried out 52 - 71 days after the first interview. **Results** : Inter-tester reliability: All 20 items had Kappa's ranging from 0.45-0.8; 15 items had Kappa's > 0.6; 8 items had Kappa's > 0.7 Intra-tester reliability: All 20 items had Kappa's ranging from 0.51-1; 15 items had Kappa's > 0.6; 12 items had Kappa's > 0.7 The first interview had a SALSA score ranging from 17 – 78 (Mean 36.5, 95% CI 34.96-38.05). The second interview had a SALSA score ranging from 17 – 76, (Mean 35.02, 95% CI 35.01-37.99). **Conclusions** : The Hausa translation of SALSA has an acceptable reliability in Nigeria provided the interviewers are well trained. **Keywords** : SALSA, Reliability, Activity limitation, Hausa, Nigeria.

SPL-34

Comparative Analysis of SALSA Scale Among the Rural Leprosy Affected Persons in Adilabad District

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This paper presents the comparative analysis of SALSA (Screening of Activity Limitation and Self Awareness) scale among the rural leprosy affected persons in Adilabad district of Andhra Pradesh. SALSA scale used in the year 2004 among 51 GII cases to measure the activity limitation and self awareness among the sample of 51 GII persons. After three years period of time it intends to compare and understand the development and deterioration of the 51 GII cases through SALSA scale. Since leprosy causes disability and insensitivity in different parts of the body it is likely to avoid unsafe activities to reduce the risk of injury. Therefore it is imperative to assess how far clients were using safety measures in their day to day activities in comparison to 2005. Repeatedly the previous data formats were used to collect the information from the same clients (sample) to compare the activity limitation and self awareness at two different points of time. Based on the responses obtained through questionnaire in the earlier period, some questions are supplemented in the present study to gather additional information. Overall the study gives an impression in the improvement of activity limitation and self awareness among the selected sample of 51 GII persons.

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Introduction : Dermatology Life Quality Index (DLQI) and Screening of Activity Limitation & Safety Awareness (SALSA) questionnaires were applied to evaluate the impact of leprosy deformities (incapacity degree 1 and 2) on quality of life of patients post treatment WHO/PQT. **Methods:** DLQI and SALSA were applied on 50 patients post treatment WHO/PQT. The extension and severity of deformities were determined by EPIINFO2000. The score of DLQI varies between 0 and 30 and the SALSA from 0 to 10. We used the Spearman coefficient for statistical analysis. **Results:** DLQI showed 44% commitment (moderate to very severe) in the quality of life. SALSA showed 38% of none risk awareness among leprosy patients. **Conclusion:** The questionnaires are complementary in demonstrating the decrease in patient's quality of life. DLQI and SALSA prove that the most severe cases have the more important losses in daily life. **Keywords :** quality of life; questionnaires; DLQI; SALSA.

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Introduction : SALSA and Participation Scales are relatively novel means of assessing patients with disabilities. Their use to evaluate chronically disabled, asylated ex-patients of leprosy can be useful in several aspects. The assessment of management efficacy can be one of the applications of such scales. In this work, patients of the Casa de Saúde Santa Fé, Três Corações, MG, Brasil, an ex-colony of leprosy, have been evaluated in such a way. **Methodology :** 40 patients (20 male, 20 female), all asylated, all above 50 years of age, with advanced degrees of physical disabilities, were evaluated using SALSA and Participation Scale methods. The results have been tabulated and analysed. **Preliminary results :** The scales were reliable and easy to use in this context. Initial results have been obtained and will be compared to future others, after management strategies can be changed, as oriented by present results. **Conclusions :** SALSA and Participation Scales can be useful in the evaluation of asylated, chronically disabled ex-leprosy patients. **Keywords :** Leprosy. Disabilities. SALSA. Participation Scale.

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The SALSA scale has been developed to measure activity limitation in persons affected by leprosy as perceived by the person himself. Other assessments measure function and activity limitation objectively by time or by therapist's perception. The aim of this study was to investigate and validate the hand-related activities in the SALSA to other hand function assessments. 26 persons affected by leprosy were studied. Data collection included sensory and motor status of median and ulnar nerves, the EHF disability score, the SALSA score and level of performance of The Functional Dexterity Test, The Nine Hole Peg Test and seven bilateral ADL tasks from the Smith Hand Function Evaluation. Overall, the SALSA score for hand-related activities in this group varied from 13 to 47 (mean 21.5). The means of the hand function test results were generally found to be above norms for these tests. A detailed comparison of the findings with relation to neural status, EHF disability score and self-perceived measures versus objective measures will be presented. The credibility of SALSA is enhanced by validation studies such as these. SALSA is a useful assessment tool in occupational therapy practice to measure the level of function and activity limitation at baseline and pre/post interventions, enabling evaluation of efficiency of intervention.

Free Papers - Clinical

O-1

Ofloxacin Containing Drug Regimens in MB Leprosy

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This WHO-sponsored study examined the relapse rate after two ofloxacin-containing regimens, compared with standard WHO/MDT given for either 1 or 2 years. 230 smear positive patients were enrolled in a prospective, double-blind trial. Four different regimens were tested: A) 64 patients received WHO-MB-MDT for 1 year, B) 65 patients received regimen A plus ofloxacin daily for the first four weeks, C) 73 patients received rifampicin and ofloxacin daily for 4 weeks, followed by placebo, and D) 28 patients received regimen A for 2 years (the control group). Relapse was diagnosed when the appearance of new skin lesions was confirmed by histopathology or an increase in BI of $\geq 2+$ at any site. One patient relapsed in group A, 2 in group B, 10 in group C and none in group D. Follow-up averaged 10 years, except in group D, in which it was 7 years. **Conclusion:** A short course of two bactericidal drugs, rifampicin and ofloxacin, taken daily for four weeks, cured 86% of MB cases. The cure rate in both 12 month regimens was between 95% and 99%.

O-2

Longterm Outcome of R.O.M. Therapy

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Rifampicin-Ofloxacin-Minocycline (ROM) combination therapy for single lesion Paucibacillary leprosy was introduced in 1998. Since then thousands of patients have received this treatment. There is very little published evidence on the long term effectiveness of ROM therapy. From the computerized records of the leprosy control project we identified 310 cases treated by ROM more than 5 years previously. These were followed up at home by trained volunteers and re-examined at the clinic by qualified staff if they had any residual or additional lesions. Ten cases of PB relapse were identified amongst the cohort. Of these, three were found only by the active follow up whereas seven had presented themselves at clinic earlier. No case of Multibacillary leprosy nor anyone with nerve function impairment was found amongst the cohort. Health workers should be aware of the small risk of relapse after ROM therapy, but the low risk of disability or transmission of disease for these patients may not be enough to justify active follow up.

O-3

MDT (3 Drugs) for 6 Months : A Revised Proposal for MB Leprosy

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Introduction : In India about 100% children and 60% adults remain infected with worms and from this population the leprosy patients come. We included Albendazole with revised MDT which gave better results as compared with WHO/MDT(MB) for 12 months. **Methods :** 25 new MB pts.(Trial group.) were given revised MDT(Rifampicin-600mg, Ofloxacin-400mg and Dapsone-100mg) daily for 6 months. First month all patients in trial gr. were given Albendazole 400mg, OD for 21 days. Albendazole repeated for each pt. on 3rd. and 6th.month. Skin smear on 1st, 4th, 5th, and 6th months for all. 25 new pts were put under WHO/MDT(MB) as Control gr. Each gr. contained (BT-15, BL-6, LL-4), having all pts in each gr. smear +ve. **Results :** In trial gr. all BT (MB) pts and five- BL pts, and one-LL pt. became negative at the end of 4th month. Rest of the pts had mild hyperglycaemia which had to be given Metformin 500mg (SR) for the rest of the period and became negative at the end of 6th month. No pt had suffered from reactions. 25 pts of the control gr. with WHO/MDT (MB) none of them became smear negative by the end of 6th month. All of them developed reactions within six months. LL pts had mild to severe ENL. It was only >2 years treatment that pts in control gr. became smear negative. **Conclusion :** Associated infections mainly with helminthiasis require to be considered for proper treatment of all forms of leprosy.

A Study of Outcome of 6M MB MDT Regimen in Bangladesh

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Multi-drug therapy (MDT) has been effective in curing Multi-bacillary (MB) leprosy. Reduction from current recommended duration (one year) to 6 months is under consideration. This study will show the outcome of 6months MDT for MB leprosy, as increase in disability or incidence of relapse over a 10 year follow up period, according to initial smear result. New leprosy cases enrolled over an 18m period, who receive 6m MDT, are compared with a historical cohort who received 12m MBMDT (patients registered in the previous year at the same clinics). Patients' clinical examinations and nerve function assessments are done monthly for 12months then annually. Smears are done at registration, at Release From Treatment, then every 2 years. The two cohorts' enrollment characteristics and results of the first 2 years follow up will be presented, in 3 groups according to initial smear results. Before general recommendations are made to shorten the standard MDT regimen, information is needed on the outcome in different categories of patients. **Key words** : multibacillary, multidrug therapy, relapse rate, disability

Resistance to Anti-leprosy Drugs

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This study was undertaken to determine the extent and nature of resistance of *M. leprae* to anti-leprosy drugs, especially to Rifampicin in a population where MDT has been extensively for 20 years. The study was carried out on patients registered in the Gudiyatham Taluk of Vellore District from 2004-2007. Primary resistance was studied among new untreated leprosy patients and secondary resistance among poor responders (patients who completed MB-MDT (12 doses) but did not show the expected 1 log decline in BI and patients diagnosed as a MB relapse. Mouse footpad study was done using the Rees technique. PCR-Direct sequencing will be done for detection of mutations in *rpoB*, the gene responsible for resistance towards Rifampicin and folP gene responsible Dapsone resistance. A study on risk factors among that exhibiting drug resistance was also studied. The results of the mouse footpad studies and the molecular techniques will be reported.

Preliminary Report of Pilot Project U-MDT Regimen for Leprosy Treatment – Hospital of Clinics - Federal University of Minas Gerais – Brazil

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In 1981, WHO recommended multidrugtherapy regimens to treat leprosy. These regimens have limitations, as the prolonged duration. There is the possibility multibacillary regimens could be shorter, and a same regimen could be used for multibacillary and paucibacillary leprosy. In nowadays, WHO is trying to evaluate possibilities to introduce shorter and uniform treatment regimen to paucibacillary and multibacillary leprosy – U-MDT. This pilot project of Hospital of Clinics/UFGM evaluates the viability and manageability of U-MDT protocol research and involved 35 leprosy patients during the period of November 2004 to June 2006. These patients, after agree and sign the term of consent, received the U-MDT regimen during six months. From 32 patients that concluded the treatment, 31 have been followed, being 83% MB, 45% with positive skin smears, 58% have positive ML Flow tests, 29% had reactions leprosy during the treatment and 48% after this. These patients will be followed for a period of eight years. **Key-words** : leprosy, treatment, epidemiology and control.

Effect of Corticosteroid Usage on the Bacterial Killing, Clearance and Nerve Damage in Leprosy; A Prospective Cohort Study – Longitudinal Observations

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Objective & Methods : To investigate adverse effect/s if any of the therapeutic usage of corticosteroids (Prednisolone 40 mg tapered to 5 mg over 12 weeks given to treat reaction/neuritis) on killing and clearance of bacteria, granuloma clearance and the resultant nerve damage. The rate of clinical regression, bacterial/antigen clearance, and nerve function assessment findings were compared at 18 months in 100 pair matched cases each with (Gr. A) and with out (Gr. B) steroid treatment, from the cohort of 400 cases to study the difference. Analysis was performed using SPSS version 10.0. The significance of association was tested using Chi square test. **Results :** Clinical findings: Rate of clinical regression was comparable in the 2 groups (A= 53 % B= 55%. Proportion of cases showing improvement in deformity was higher in Gr. A (9%) as compared to Gr. B (3%) where as no showing deterioration were comparable (4% each) Bacteriological findings: Rate of bacterial clearance was higher in Gr. A (24/39=62%) as compared to Gr. B (18/39= 49%) but the difference was not significant. Significantly, proportion of cases showing viable *M.leprae* (among BI positive cases) were comparable in the 2 groups. However cases with repeat episodes of reaction and requiring multiple course of steroids showed a higher incidence of viable *M.leprae* (3/27=11%) as compared to those with single episode (3/72=4%) indicating a relationship between the quantum of steroid received /or reaction episode and viable *M.leprae*. Neurological findings: Improvement in the deformity status was significantly higher in Gr. A as compared to Gr. B. NCV testing showed that the proportion of motor nerves showing improvement and deterioration were comparable in the 2 groups where as sensory nerve deterioration is marginally higher in Gr.A, implying that steroids have helped in keeping the nerve involvement under control. **Conclusions :** Usage of steroids plays a useful role in the control of motor nerve damage. Occurrence of viable bacteria was also comparable in 2 groups (14%&12%) proving that the usage of steroids has not altered the quantum of 'persisters'. However, occurrence of viable bacteria was higher among cases with multiple episodes of reaction (3/27=11%) as compared to single episode (3/72=4%). Additionally a significant proportion of cases (~14%) showed the presence of viable *M.leprae*, as shown in the normal mouse footpad, suggesting that usage of Steroids is not advisable at any point in time with out MDT coverage. **Key words :** leprosy, corticosteroids, persisters, nerve damage.

Study on Relapse Among Multibacillary Leprosy Cases

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A study was conducted on 65 multibacillary leprosy patients with bacteriological index greater than 2.0 at any given site, attending the OPD at CLT & RI. The study group consists of: 1. New cases, 2. Relapse cases and 3. Treatment defaulters with recurrence. The study is aimed to identify the viable bacterial load in terms of BI and MI and also by histopathological and animal inoculation in the above study subjects to understand the drug resistance pattern. Incision biopsy was performed with the consent of the patients and a portion of tissue was excised from heavily infiltrated bacilliferous lesion was sent for mouse foot pad and histopathological examinations. This study revealed that the clinical diagnosis of leprosy is well correlated with histopathology and bacillary index. Few samples of mouse foot pad inoculation showed positivity. Of the 65 cases studied 37 were found to have relapse. One case found to have resistance to triple drug regimen (WHO MB MDT). 6 study subjects were resistant to dapson. Results will be discussed. **Key words :** Leprosy relapse, drug resistance.

A Comparative Study Between an Ofloxacin Containing Regimen and WHO-MDT in PB Leprosy

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This study aimed to determine the therapeutic efficacy of an Ofloxacin containing regimen compared with WHO-MDT in PB leprosy. 124 untreated PB patients were enrolled in a randomized, double blind study. Of these patients, 58 received daily supervised doses of the rifampicin - ofloxacin combination for one month, while 66 received WHO-MDT for PB leprosy. Relapse was defined as the appearance of new lesions non-responsive to steroids or a BI of $>2+$ at any site. Histopathology confirmed relapse. In both groups, clinical response was comparable. The average follow-up was 11 yrs. The ofloxacin group had one early relapse 3 yrs after whereas the MDT group had two late relapses 8 & 12 yrs after treatment. Early relapse in the ofloxacin group suggests inadequate treatment whereas the late relapses after MDT suggest disease reactivation due to persisting organisms. Re-infection could explain any recurrence, and cannot be ruled out. Our findings further suggest the long-term therapeutic efficacy of WHO-MDT which remains the regimen of choice for PB leprosy.

Clinico-histopathological Comparative Study of U-MDT and WHO MDT in Pauci and Multi Bacillary Leprosy Patients Over 24 Months of Observation

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Aim : To compare efficacy of uniform multi-drug therapy (U-MDT) of 6 months duration, in patients of leprosy against the existing MDT-PB and MDT-MB regimen based on clinical and histological parameters over a period of 24 months. **Patients and Methods:** 127 newly diagnosed, untreated leprosy patients were classified into PB (<5 skin lesions) and MB patients (>5 skin lesions). They were divided into Study (on U-MDT for 6 months) and Control groups (WHO MDT) alternately at entry. Out of the total 127 patients included in the study, 64 patients (M-44, F-20) could be followed, of these, PB patients were 32 and MB patients were 32. All these 64 patients were clinically and histopathologically assessed and graded (Poor, Moderate and Good response) at entry, 6, 12 and 18 months of the study and 44 of these patients were also assessed at 24 months of the study. **Results of the PB groups :** In the PB group, study and control groups comprised of 18 and 14 patients respectively. When the clinical grades in various study intervals in PB groups were compared between study and control groups, at 6 months the number of Moderate and Good responses were 78% in PB Control group compared to the PB Study group 61%. By 18 months the Moderate and Good response were higher (94%) in the PB-Study group compared to the PB-Control group (86%). However, by 24 months, all the patients (100%) assessed in study group were showing either moderate or good response. While in control group 18% of patient still showed poor response. These results indicate the progressive improvement in PB-Study group compared to PB-Control group. However, the differences in the clinical responses at various time intervals were statistically not significant. (At six months $p=0.2195$, at 12 months $p=0.4656$, at 18 months: 0.7305 , at 24 months $p=0.3503$) On histopathology, the improvement was similar between PB-Study and PB-Control groups at the end of 6 months. However, at 12 months of study, PB-Study group showed higher percentage of Good responses (89%) compared to PB-Control group (42%). **Results of MB group:** In the MB group, the Study group comprised of 10 patients and Control group, which had 22 patients. The results of the clinical comparisons between MB Control and Study group reveal that the percentage of Good responses were consistently high in MB Control group at 12, 18 and 24 months of study whereas the MB Study group did not have single good response at 12 and 18 months. More importantly, the percentage of Poor responses in MB Study group was 50%, 67% and 75% at 12, 18 and 24 months respectively. This differences in the clinical responses between MB-Control and MB-Study groups were statistically highly significant at all periods of assessment. (At 12 months $p=0.0465$, at 18 months $p=0.0014$, at 24 months $p=0.0064$). Similarly, in results of histopathology, the percentage of Good responses of MB-Control group was higher (77%, 91%, and 100%) at 12, 18 and 24 months compared to MB-Study group (75%, and 50%) at 12 and 18 months. **Conclusions :** In the PB-Study group of patients who were on U-MDT, the drug regimen was well tolerated and patients showed good response over 24 months of observation, which was marginally higher compared to the control group on WHO MDT-PB, with the difference in the improvement grades being statistically not significant. However, the U-MDT regimen was found to be insufficient to improve the clinical parameters and morbidity in majority of patients over 24 months of observation in the MB-Study group compared to MB-control group of patients on WHO- MDT-MB regimen, the difference in response being statistically highly significant.

O-11

The Usage of Biologically Active Addition (BAA) "Kanteparin" in Therapy of Leprosy Patients with Liver Damage

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The aim : to study the effectiveness of BAA "Kanteparin" in leprosy patients with liver damage. BAA "Kanteparin" (producer "Institute of Molecular diagnostics", Moscow, Russia;) containing soluted plant polysaccharides having the property of manysided regulatory action including hepartodefensive which gave the possibility to use it as hepartoprotective means in leprosy patients. 20 patients at the age of 46 to 72 with chronic liver disease were under observation. The treatment was provided by clinico-laboratory control. On the base of "Kanteparin" usage it was defined the decrease of complaints, pain syndrome, improvement of general condition. There were found out the increase of level of structural organization of blood serum, witnessing about harmonization of adaptive reaction of the organism. The received data of hepartoprotective action of BAA "Kanteparin" are preliminary. **Key words :** hepartoprotector, BAA, Kanteparin.

O-12

Powerful Bactericidal Activity Observed in the First Clinical Trial of Moxifloxacin in Leprosy

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Fluoroquinolones are effective against *M. tuberculosis*, atypical mycobacteria and *M. leprae* in vitro, mice, and clinical trials. Moxifloxacin against *M. leprae*-infected mice has been found superior to ofloxacin and as potent as rifampin. In the current study, ten male previously untreated BL and LL patients were administered a single initial dose of 400mg moxifloxacin, no therapy for seven days, and then daily observed 400mg until Day 56. Subjects were monitored for clinical response and killing of *M. leprae* in mice by the Spearman/Karber method wherein mice were infected with 50, 500, and 5,000 *M. leprae* obtained at Day 0, 7, 14, 28 and 56 of therapy. Improvement in skin lesions in all patients occurred by Day 14%more consistently rapid than all other agents. No serious side-effects/toxicities or leprae reactions were observed. In all trial patients a single dose of moxifloxacin resulted in significant killing ($P < 0.006$) of *M. leprae* ranging from 82%-99% (mean 91%). No viable bacilli were detected with an additional one or three weeks of daily therapy%this bactericide only equaled by rifampin. Thus, moxifloxacin presents great promise for the therapy of leprosy. **Key words :** Moxifloxacin, Clinical Trial, MB leprosy.

O-13

Effect of Corticosteroids on Nerve Damage in Leprosy Reaction Electrophysiological Findings in Sensory and Motor Nerves

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Objective & methods : Bilateral motor and sensory nerve conduction parameters were studied in a cohort of 365 MB cases, at onset and after 18 months. They were divided into Gr. A - reaction/neuritis, treated with corticosteroids (Cs) & MDT and Gr. B - no reaction treated with only MDT. Sensory Conduction velocity (SCV) and peak to peak amplitude of the sensory potential, distal latency, muscle compound action potential (MCAP) and amplitude of the motor potentials were compared in 2 groups. **Findings :** Baseline - Overall sensory nerves were more frequently involved (52%) than motor (37%). Sural was more frequently (72%) and severely affected. Motor component of the ulnar (at sulcus) and median nerves showed more involvement compared to the sensory. In the sensory nerves, reduced amplitude was more common (12%) than reduced SCV (3%). In the motor nerves, reduction of MCAP was more common in the ulnar (40%) and median nerves (10%) while reduced amplitude was seen more in the common peroneal (15%) and posterior tibial nerves (20%). Gr. A had significantly higher percentage of nerve involvement (53%) as compared to Gr. B (40%) At 18 months - Of the 164 cases, 93 in Gr. A and 71 in Gr. B, 21% of the recordable parameters showed worsening while only 8% showed improvement. Worsening of sensory amplitude was maximum in radial cutaneous nerve (20%) and least in median nerves (7%). Ulnar motor nerve showed maximum worsening (36%), followed by the median and posterior tibial nerve (19% each). Worsening of both sensory and motor nerves was slightly higher in Gr. A. (25%) as compared to Gr. B (17%); [$p = < 0.1$], while the trend was same in the two groups. **Conclusion :** Despite the added susceptibility to nerve damage due to reaction, the extent of worsening and improvement were comparable in the 2 groups indicates that Gr. A has actually benefited from the Cs. **Key words :** Leprosy, nerve damage, NCV, corticosteroids.

O-14

Clinical Assessment of Type II Leprosy Reaction : Therapeutic Co-Administration of Thalidomide with Prednisolone

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Thalidomide is used as a drug for therapeutic management of type II leprosy reactions. In the present study we have attempted to assess the maintenance dose, duration of thalidomide treatment in patients with type II leprosy reactions in co-administration with prednisolone. The study subjects are (47 patients) reporting to OPD of CLT&RI for treatment of recurrent type II reaction treated in our institute and elsewhere. These study subjects were admitted in investigation for clinical follow up and management of leprosy reactions. Details regarding the onset, duration of the disease, treatment with anti-leprosy chemotherapy (MDT), steroids were obtained. Women of child-bearing age were excluded from this study. A thalidomide dosage of 300 mg/day in three divided doses for one month, followed by 200 mg/day in two divided doses for one month and 100 mg / day for ten months was administered. In the present study we noticed that thalidomide was very effective in controlling the type II reaction in time dependent manner at the above said dosage rendering the patient asymptomatic in three weeks. Drug defaulters reported very early with clinical symptoms of reactions. Thus it is inferred that thalidomide is effective in controlling symptoms of type II reactions promptly. However, prolonged (one year) administration of drug needed as it only suppresses the symptoms of reactions but does not alter the duration of reaction. **Key words** : Leprosy, Leprosy II reaction, Thalidomide, dosage.

O-15

Factors Influencing the Outcome of Steroid Therapy Among Leprosy Patients Having Loss of Motor Nerve Function

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ALERT INDIA conducts Leprosy Referral Centres (LRCs) under its 'Leprosy Elimination Action Programme' (LEAP) to provide quality care to all leprosy patients referred by GHC in N, S & T wards of Mumbai. LRC's manage leprosy patients with complications such as reactions and neuritis besides treating patients with various types of deformities. 350 leprosy patients were given steroid therapy during January 2003 to September 2007 for various indications at LRCs. The factors related to type and time of occurrence of reaction, duration of motor function loss, age, sex, compliance for steroid therapy, etc. were studied. The outcome for steroid therapy administered for different indications, especially in patients having motor function loss were analyzed. There was significant improvement in motor functions following treatment as assessed by clinical methods. However there were patients who showed no improvement in the motor function even with steroid therapy. The factors influencing the negative outcome are discussed. The importance of early diagnosis and the regularity of treatment are emphasized. The role of steroid therapy in preventing deformity is still unpredictable and the need for an in depth study on the factors responsible for, poor response is stressed.

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Type 2 Reaction of Leprosy Hospitalized Patients at A University Hospital : Study of Immunological Mechanisms and Their Clinical Expressions

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Introduction : Review of 133 files of Leprosy patients presenting type 2 reaction, admitted to our University Hospital, from 1979 to 1990, to assess clinical, epidemiological, immunological and laboratorial data. **Results**: Fifty percent of the patients were between 21 and 40 year-old, and the majority was female (57.9%). Lepromatous form was seen in 72.9% and borderline in 25.5%. Erythema nodosum late reactions were more frequently seen in the lepromatous form (71%) than in borderline form (44%). There was lower incidence of polymorphic erythema (13% and 32%, respectively). Lucios' phenomena were observed in 15.4% of lepromatous patients and in 23.6% of borderline patients. Immunoglobulin profile was similar in both groups. Articular commitment was seen in 55.6% of the cases. **Conclusion** : The combination of exams and effective clinical and immunological evaluation can help to monitor and to prevent the disabilities and neural injury. **Key words** : Type 2 Reaction : Leprosy; Immunology.

O-17**Thalidomide in ENL-Study on 36 Patients at - Gouripur Leprosy Hospital, Bankura, WB, India**

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Introduction : ENL is still a challenge to leprologists as a large no of patients developed ENL gets nerve damage and leads toward deformity & ultimately disability. Intolerable pain, morbidity due to systemic damage is also frequent & mortality is also not uncommon. A number of drugs including PREDNISOLONE has been used but has some limitations/complications. Thalidomide has a good immunomodulatory & anti-inflammatory property effective in many conditions including ENL. **Methodology:** 36 pts with severe And /or recurrent ENL were treated with thalidomide in 2006-07 at GOURIPUR LEPROSY HOSPITAL , BANKURA, WB, INDIA, who were selected on the basis of some criteria mainly age/sex/ steroid failure & dependency. **Result:** Study showed significant improvement in clinical I status of the pts . Details of the result will be shown by chat & graph **Conclusion-** Reintroduction of Thalidomide has enlightened the hope to treat complicated ENL. **Key-words :** ENL, Thalidomide.

O-18**Occurrence of Leprosy Reactions During Pregnancy and Postpartum**

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Hormonal influences on immunological phenomena are well documented. Previous studies have suggested that the behavior of leprosy reactions is different during pregnancy. A prospective, international, multi-center study of leprosy patients was conducted in Brazil, the Republic of the Philippines, Nepal, and the USA. From this study population, data were included from all women who were pregnant at diagnosis or during treatment. From Brazil and the Philippines, a total of 20 women were followed during all or part of 22 pregnancies. Reactions were observed in 9 of the 20 women; 3 women had 2 episodes of reaction, so that a total of 12 reactions were observed. Two women developed neuritis without other signs of reaction, long after delivery. Type 1 reactions occurred predominantly during the first two trimesters; Type 2 reactions occurred predominantly during the last trimester and post-partum period. Although the sample is small, the difference in distribution was statistically significant ($p < 0.05$) when analyzed by the Cochran-Armitage Trend Test. The occurrence of Type 1 and Type 2 leprosy reactions differs during pregnancy and the postpartum period. This may be due to the effects on immunological function of the changing hormonal milieu during pregnancy and lactation.

O-19**Erythema Nodosum Leprosum as Immune Reconstitution Inflammatory Syndrome in a HIV Infected Person**

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Early in the AIDS epidemic it was feared that HIV would undermine leprosy control. Patients with both infections would have increased risk of lepromatous disease, faster clinical evolution and difficulties in diagnosis and treatment. Published data shows none of these concerns. HIV did not seem to change the natural evolution of leprosy. The reason may be its prolonged incubation period or the diminished cell-mediated immunity. After starting highly active antiretroviral treatment (HAART) an individual with HIV infection was reported in 2003 for developing borderline tuberculoid leprosy as CD4+ lymphocyte count improved and plasma HIV load decreased which strongly suggests the immune reconstitution inflammatory syndrome (IRIS). This inflammatory reaction to an opportunistic infection occurs in HIV patients with profound immunosuppression during the reconstitution of the immune system in the initial months of HAART. There are only 9 cases of leprosy and IRIS reported. We describe an HIV infected patient who started HAART and developed erythema nodosum leprosum fulfilling the criteria for IRIS. **Keywords :** leprosy, HIV, HAART, AIDS.

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To assess the use of thalidomide in patients admitted for ENL reaction at Anandaban Hospital. Severe ENL is recurrent and chronic and may vary in its presentation. The management of severe ENL is best undertaken by a physician at a specialist referral centre. Thalidomide has been used for the management of ENL in Anandaban Hospital. The hospital records and patient files of 47 ENL patients who had received thalidomide were studied. The average duration of thalidomide used was 19 weeks. 12% of the patients received repeated courses of thalidomide. The mean age of the patients was 33 years. Almost all of them had already received prednisolone and lamprone before they were given thalidomide. 75% of the cases were classified as LL.

A Study on Effectiveness of Prescribed Course of Steroids for Acute Neuritis in Leprosy

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Introduction: Reaction and Neuritis is an inflammatory complication in leprosy leading to nerve damage. Prednisolone is the drug of choice, and is considered to be most effective in the early stage of neuritis. The recommended therapy is a starting dose of 40 mg/day tapered over a 6 month period. Response to steroid therapy has been found to be good in cases with motor palsy, particularly when the nerve trunk was paralyzed only incompletely. The outcomes have not always been satisfactory. A study was done at our hospital on all cases of neuritis presenting with history of less than 6 months duration using the prescribed therapy. **Results :** Only 20% of patients showed significant recovery of nerve function, while another 40% showed only marginal improvement, about 20% in fact, remained the same and another 20% degraded. No specific associations were seen in terms of clinical or demographic parameters. Further research will be required to determine for the optimal dosage and duration for management of acute neuritis. **Key words :** neuritis, steroids, response.

Type 2 (ENL) Reactions Observed in MB Patients Treated with One Year and with Two Year WHO-MDT

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This study aimed to compare the incidence, severity and the possible risk factors for ENL between patients treated with one year and with two year WHO-MDT. A cohort of 300 MB patients from each group were compared and analyzed. The total observation period was up to 48mos from the start of treatment. The 12month group had 59 cases of ENL, while the 24month group had 36 cases. The Odds Ratio for the 12month group is 1.9 (95% CI:1.2-3.1); showing that the 12month group had almost twice the risk of developing ENL than the other group. For those with ENL, the Odds Ratio for developing the more severe form is 8.7 (95%CI:3.0- 25.7); showing that the 12month group is almost 9 times more likely to get more severe ENL than the other group. Although the average BI was slightly higher in the 12month group, it is unlikely to account for the magnitude of the difference in ENL. In both treatment groups, a high bacterial index was recognized as a risk factor for developing ENL. Our findings seem to show the greater risk of ENL in the one year MDT group, possibly because of the earlier stoppage of treatment long before bacterial clearance, particularly of clofazimine which has a significant anti-inflammatory effect in suppressing ENL.

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Introduction : BOLEP is a LEPRO Society project covering the entire Subarnapur district. It is in operation since 1991 and has under taken POD/POWD activities since 1997. Treatment of Nerve function impairment (NFI) is an important aspect in leprosy failing which it will lead to permanent disability. This study aims to present the retrospective study of 42 such cases treated during 2005-06. **Methodology :** All these cases were referred by Paramedics of the project and PHCs to the project head quarter where an indoor care facility is available. Medical Officers with the support of Physiotherapist assessed the cases and prescribed necessary treatment. All the cases were treated with WHO scheduled course of steroids and physiotherapy. **Results :** It has been observed that the recovery rate is better in NFI cases, those who are treated within 6 month of onset of the new impairment. On an average, full recovery is seen in 53% of cases while partial in 26. No recovery is seen in 21% of cases. The nerve specific recovery is also calculated and the high recovery (64%) is noticed in ulnar, low recovery (33.3%) in Median, whereas medium recovery in lateral popliteal & facial (50%) and posterior tibial (42.8%). Of the treated 42 cases, 35 (83.3%) were MB and 7 (16.7%) were PB. 34 (81%) were male and 8 (19%) were female. Impairments were seen in 57 nerves. Amongst 42 cases, 37 (88.1%) were under MDT and the reaction is associated with NFI in 27 cases (64.3%) Conclusion Ulnar nerve is the commonest nerve involved High association of reaction and NFI MB cases are more prone for NFI. **Key words :** POD/POWD, NFI, Physiotherapy, Reaction.

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Introduction : Reports published in the literature describe the use of several medications such as vitamin B1, calcium, magnesium and others in the treatment of neuropathic pain in Leprosy. We present our observations in a pilot investigation with Carbamazepine in the treatment of neuropathic pain in leprosy. **Materials and Methods :** Fourteen patients of BT and BL type of leprosy with neuropathic pain (tingling numbness, burning sensation, paraesthesia, heaviness of extremities) attending the Referral Centre of Bombay Leprosy Project were recruited. These patients were being treated with prednisolone, thalidomide and other supportive drugs for management of reactions, neuritis. Despite being on treatment, neuropathic symptoms persisted, were painful and troublesome to the patients though reaction had subsided in some cases. Following initial assessment and consent, carbamazepine was started at 100 mg / day and gradually increased to 200 mg / day and later increased to 300mg / day in divided doses and continued over a period of 3 to 6 months. **Results :** Twelve out of fourteen patients reported good improvement and subsidence of neuropathic symptoms. None had any intolerance or adverse effects so far. Follow up is in progress. **Conclusion :** It is worthwhile exploring the role of carbamazepine in a larger sample of patients in the management of neuropathic pain in leprosy to alleviate the misery and improve the quality of life of patients.

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Type I reactions are an important complication of borderline leprosy and are a significant cause of disability. A validated tool providing a standard measure of disease severity would aid the development of treatment guidelines and clinical trials. **Methodology :** Leprosy patients in Bangladesh and Brazil diagnosed with type I reaction were assessed using a modified version of the INFIR reaction severity scale which incorporates signs of cutaneous involvement, neuritis and nerve function impairment. The scale was administered independently of an examination performed by an experienced leprologist who categorized the reaction as mild, moderate or severe prior to treatment. **Results :** 81 patients (64 male) were recruited. 70 had complete data. 18 were diagnosed as having a mild type I reaction, 40 moderate and 12 severe. The median scores for reactions categorized as mild were 6.0 (Range 2-30), moderate 10.5 (3-57) and severe 18.0 (4-61). Comparing the scores (Mann-Whitney test) of the categories of severity: mild and moderate and moderate and severe showed significant differences between the mild and moderate groups ($p=0.03$) and the moderate and severe groups ($p=0.015$). **Discussion :** This type I reaction severity scale is a valid measure of disease severity. Further work is underway to measure inter-observer reliability and to determine the weighting of individual items in the scale. The ability of the scale to reflect changes in disease severity over time and with treatment is also being assessed. **Key words :** Leprosy, type I reactions, severity scale.

M. leprae Causing Specific Bone Lesions

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Introduction : We present two cases of specific bone lesions in patients with leprosy. Both patients developed type 2 reaction and radiological investigation disclosed multiple bone abnormalities. X-ray, scintigraphy and bone biopsy were performed. **Results :** Two male 36 and 42 year-old patients, under WHO/PQT MB leprosy treatment were diagnosed type 2 reaction. General examinations were done, as well as X-ray studies showing extensive bone lesions. Bone biopsy and bacteriological study of surgical fragment proved the presence of acid-fast-bacilli. Follow up: thalidomide and prednisone were tapered off until the end of treatment. **Conclusion :** In our study, X-ray, scintigraphy and bone biopsy revealed severe osteitis with the presence of bacilli. The detection of bacilli in the bones was possible only because of the reaction episode, which is characterized by immune complexes formation and complement fixation, increase of TNF-alpha, chemotaxis and tissue destruction. It is known that high TNF-alpha plasma concentration stimulates bone reabsorption and osteoclasts. **Key Words :** Leprosy; Bone lesions.

An Investigation into Steroid-Induced Diabetes in Leprosy at Kolkata, India

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Introduction : Leprosy induces chronic reactions in some patients. Steroids are the drug of choice, but can lead to many side effects including diabetes, glaucoma, etc. Steroid induced diabetes is a serious complication. In this paper, the problem of steroid induced diabetes is explored. **Methods :** Male and female leprosy patients with reactions and neuritis, with no previous history of diabetes and blood sugars in the normal range were included. Fasting, Post-prandial and Random blood sugars were estimated at the beginning of treatment with steroids, and monthly during steroid therapy. **Results :** A total of 75 patients were studied, of whom 16(21%) clearly manifested diabetes through a significant rise in blood sugar levels. The analysis describes correlates and the implications are discussed. **Conclusion :** It is concluded that steroid induced diabetes is not an uncommon phenomena in patients who had long term steroids for recurrent reactions, and must be carefully monitored and appropriately managed. **Key words :** steroids, diabetes.

Changes in Oxidative Stress Across the Spectrum of Leprosy

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Introduction : In a chronic disease like leprosy, free radical mediated injury plays a role in the pathogenesis of cellular damage. An attempt was made to correlate the spectrum and extent of disease with the degree of oxidative stress in the body. **Methods :** After thorough clinical examination, slit skin smears and biopsy, 2 groups were created- MB & PB & 30 patients were recruited in each. The serum of these patients was subjected to 3 tests: FRAP (ferric reducing antioxidant capacity) a measure of total plasma antioxidant potential, glutathione levels (a normal plasma antioxidant) and Malondialdehyde – a marker of cell damage due to oxidative stress. **Results :** The levels of these markers were significantly higher in MB as compared to PB. On correlation with disease spectrum, the levels of FRAP & glutathione were found to decrease with increasing number of skin lesions, new lesions, increasing BI & the presence of deformities. The reverse was found to be true for malondialdehyde - the levels increasing from TT to LL Hansen's. **Conclusions :** The oxidative status of the body deteriorates across the spectrum from TT to LL; or oxidative stress increases with increasing level of involvement **Key words :** oxidative stress in leprosy, oxidative stress.

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Reversal reactions (RR) are the leading cause of disabilities & deformities in leprosy & hence need to be recognized and managed promptly. This study was undertaken to delineate the key features of RR by observing 300 newly diagnosed cases of leprosy during the course of their treatment so that these could be used for recognizing & managing RR at an early stage. Reversal reactions (RR) were recorded in 12% (36/300) of patients, of these 6.33% (19/300) presented in RR at the time of diagnosis while another 5.66% (17/300) developed it during the course of multi drug therapy (MDT). Majority of RR were seen in patients of multibacillary (MB) cases, where the incidence was 15.94% (33/207) in comparison to patients of paucibacillary (PB) where it was only 3.22% (3/93). 8.21% (17/207) of MB cases presented in RR at the time of diagnosis while another 7.72% (16/207) developed reaction during the course of MDT. Sudden appearance of redness, swelling, warmth & tenderness in the existing skin patches, neural pain, tenderness &/or thickening of nerves are the key features of RR & should be explained to the patients before starting treatment so that they could recognize them & report to the physician without delay. **Key Words :** Reversal reactions (RR), Leprosy, Multibacillary (MB), Paucibacillary (PB)

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Introduction : The usefulness of thalidomide in Type II Reaction of leprosy is well known. Thalidomide has proved to be a boon for several leprosy patients suffering from miserable type II reactions. Maintenance therapy with steroids is avoided as this may lead to steroid dependency. We present our experience in the treatment of 144 patients referred to Bombay Leprosy Project over a period of 2 years (2005-07). **Material and Methods :** 144 patients of BL and LL type mostly with recurrent type II reactions were included mainly with the objective of studying the duration of maintenance therapy and recurrences after thalidomide therapy. Initial assessment by clinical, bacteriological and nerve examination was done in all patients. Consent and under taking were taken as per guidelines. Clinical photographs taken in selected cases. Patients were treated with 300mg/day initially tapered to 100mg twice weekly spread over six to eight months. In severe reactions, patients were hospitalized for necessary investigation and management. **Results :** Table shows the outcome after an average of eight months of therapy with thalidomide.

No of patients	Recurrence	Improved	Skin Smear status of patients with recurrence	
			Positive	Negative
144	28(19%)	07*(75%)	11	10

* 9 patients could not complete the course though they showed improvement

Conclusion : After long term administration with thalidomide with maintenance therapy, recurrence of 19% was observed. Among the recurrence, 10 patients were smear negative, which means there could be other factors responsible for recurrence apart from bacterial positivity.

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Introduction : The present study was aimed at seeing the effect of thalidomide treatment in steroid dependent Erythema Nodosum Leprosum (ENL) patients. **Methodology :** 33 patients (30 males and 3 females) with history of multiple episodes of ENL and steroid dependence were given 100mg thalidomide twice or thrice daily depending on severity of the reaction. **Results :** Thalidomide was found to be beneficial in controlling ENL reaction in 30 out of 33 cases enrolled. 3 were defaulters. All the treated patients returned to their normal avocation. Three female patients showed good tolerance and minimal side effects. Main side effects noticed were constipation, swelling of hands and feet, hypotension and drowsiness. One patient showed activation of dormant microfilarial infection. Total duration to obtain effective cure ranged from 3 months to 1 year. 5 patients required maintenance weekly dosage for 4 to 6 months. **Conclusion :** Thalidomide is effective in treating steroid dependent ENL patients and weaning the affected persons from steroids. **Key words :** Leprosy, ENL, thalidomide, steroid dependency.

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Aim of investigation : To identify the clinical characteristics of pain during leprosy reactions Type 1 (RT1) and Type 2 (RT2). **Methods:** fifty leprosy patients underwent dermatological and neurological examinations in regards characteristics of pain as well as assesment of quality of life (SF-36) during leprosy reactions. 54.0% had concluded WHO-MDT. **Results :** Pain (N=50) RT1 (n=16) RT2 (n=34) neural 37.5% 29.4% musculoskeletal 37.5% 38.2% cutaneous 25.0% 29.4% Duration > one month > six months > one year 56.2% 18.8% 6.3% 55.9% 26.5% 20.6% strong/moderate 87.5% 82.4% insidious 81.3% 52.9% regressive 12.5% 23.5% > 2 reactional outbreaks after MDT 12.5% 52.9% The lowest means scores of quality of life reported were role limitations due to physical health (20.0) and emotional (20.7) problems. **Conclusion :** Taking into consideration the intensity of pain, the low percentage of pain remission and the impact on quality of life, pain treatment should be included in the standardized leprosy reactions treatments. **Key words :** Pain, leprosy, leprosy reactions, quality of life.

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Introduction : LEPRO Society, Bargarh started community based leprosy project in October-2001. Important activity of the project is to deliver services on POD involving the GHC staff in diagnosis and management of reactions/neuritis/NFI with chemo and physiotherapy. This paper analyzes the type of reaction, trends in improvement. **Methodology :** The project so far has registered 3629 new leprosy cases (MB-1457 and PB – 2172). Of them, 165 reaction & 240 neuritis cases were identified and treated. All the cases were regularly followed up by different stake holders. The findings of this retrospective analysis are presented below. **Results :** 1. Neuritis and reaction cases constituted 81 and 95.7% respectively in MB cases. 2. Ulnar neuritis accounted for 142 (59.1%) that of followed by lateral popliteal 70 (29.2%) and facial 23 (9.6%). Involvement of median and radial nerves 1.2% and 0.8% respectively. 3. With scheduled treatment, 193 cases (80.4%) improved fully and the rest 47 (19.6%) remained static or partial improved. 4. Of the 165 reactions, 130 (78.8%) were Type-I and 35 (21.2%) were Type-II. **Conclusions:** 1. Of the 3629 cases, 405 (11.2%) developed reaction & neuritis. 2. About 80% of cases among neuritis/NFI improved. **Key words:** Reaction, Neuritis, POD.

Validation of a Severity Scoring System of Erythema Nodosum Leprosum (ENL)

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Erythema nodosum leprosum (ENL) is an important complication of borderline lepromatous and lepromatous leprosy. The absence of a validated measure of disease severity hampers clinical research on this condition. We have developed a severity scale for ENL, including skin changes, neuritis and systemic involvement, and here report field testing. **Methodology** : Nineteen Nepali leprosy patients with ENL were assessed using the ENL severity scale which was independently administered by two physicians. The severity of ENL was categorized into mild, moderate and severe disease by assessors blinded to the scale results. **Results** : The items most strongly associated with severity were number of skin lesions, degree of inflammation of lesions, peripheral oedema, malaise, fever, bone pain and arthralgia. There was good inter-observer agreement with a Pearson correlation coefficient of 0.95. The components of the scale had good internal consistency (*Cronbach's alpha* 0.73). The difference in scores between the severe and moderate groups was statistically significant. **Discussion** : This ENL severity score is a valid and reliable measure of disease severity. These findings will be compared with the results of an Indian study on 22 patients using the same scale. Further work is required to determine the weighting of individual items in the scale and the ability of the scale to reflect changes in disease severity over time and with treatment. **Key words** : ENL, leprosy, severity score.

Necrotizing Erythema Nodosum - Report of 4 Cases

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Yet the immunopathogenesis of erythema nodosum of leprosy is not completely understood, both deposition of immunocomplexes and the immune imbalance provoked by activation of the alternative and classical pathways of the complement system are crucial features. Clinically it may be characterized by fever, malaise, leukocytosis, anemia, neutrophilia, jaundice, increase in transaminases, neuritis, arthritis, adenomegaly, hepatosplenomegaly, uveitis, thrombosis, etc. Lucio's phenomenon and necrotizing erythema nodosum (NEN) represent the more intense aspect of this inflammatory response. NEN is characterized by ulcerated, painful skin nodes associated with activation of the alternative pathway of the complement system, and intense migration of neutrophils and release of enzymes that destroy the host tissue and the vessel walls, resulting in vasculitis. In order to draw the attention to this severe but rare described entity, we report 4 cases of NEN from our service in the last 5 years. Lesions predominated in the legs. NEN occurred in 2 patients before treatment for hanseniasis and associated with delivery of normal newborns; in two it occurred after 9-12 months of PQT-MB. One presented a splenic ischemia during a second episode of NEN related to an infectious cellulites. The episodes of NEN were generally well controlled with prednisone and thalidomide. **Key words** : erythema nodosum Necrosis, diagnosis.

Neurophysiologic Patterns of Type 1 and Type 2 Leprosy Reactions in Ulnar Neuropathy

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Background : Leprosy neuropathy despite being primary demyelinating frequently leads to axonal loss. The neurophysiologic approach of nerves during type1 (T1R) and type 2 reactions (T2R) implies in knowledge of these physiopathologic mechanisms. **Methods** : Neurophysiologica examinations were carried out during a clinical trial to assess the effectivity of steroid treatment, 28 ulnar nerves, 19 T1R and nine T2R, were followed-up during six months, covering eight assessments for each nerve, in three segments, 224 at all. The parameters evaluated were the compound motor action potential (CMAP) elicited on those three sites, the distal latency, the conduction velocity along the forearm and across elbow, the temporal CMAP dispersion at and above the elbow and the F wave. Statistics were done to verify the significance of the differences noted for each variable. **Conclusion** : The axonal and demyelinating neurophysiologic changes were more conspicuous across the elbow, in T1R and T2R nerves. But demyelination, primary events, showed differences: in T2R, Conduction Block was observed more often, an acute phenomenon, and in T1R, Temporal Dispersion, a subacute phenomenon. **Key words** : Leprosy, reactions, ulnar neuropathy, neurophysiology.

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Nerve function assessment (NFA) has an important role in the diagnosis of leprosy and the assessment and monitoring of nerve function (impairment) in leprosy reactions. Manual muscle testing and sensory testing, with either ballpoint pen or monofilaments, are the tools that are most commonly used. This presentation reviews important aspects of NFA and will discuss some recent insights in NFA as it relates to the nerves commonly involved in leprosy neuropathy. Areas for further research will be indicated.

Keywords: Nerve Function Assessment.

Hepatitis C Virus and *Mycobacterium leprae* Coinfection – Report of Two Cases

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The few reports existing on leprosy-hepatitis viruses co-infection suggest that such coinfections do not modify leprosy's natural course. We describe two leprosy-hepatitis C virus cases. The first remained positive for hepatitis C virus (HCV) PCR after 6-months IFN- γ treatment, when she presented peripheral sensitive neuropathy and 2 new lesions. Histopathology showed thickened nerves and negative bacilloscopy. Mitsuda reaction was 2 mm. Borderline leprosy was diagnosed. She was treated with MDT-MB for 12 months with regression of the lesions. She was then put on IFN- γ ribavirin for 1 year with virus clearance. As the foot's anesthetic area increased, a biopsy of the sural nerve was taken, showing positive bacilloscopy. Meantime, HCV reactivated. Antiviral treatment will be reintroduced only after other PQT. The other patient has been treated for borderline leprosy with MDT-MB for 2 years but remained with type 1 reactions for more 2 years, partially controlled with low-dose corticosteroid. HCV was diagnosed during investigation of the reaction. In the first case the antiviral treatment may have triggered the clinical manifestations, similarly to the recently described leprosy-HIV coinfection IRIS associated with HAART. The second case suggests that flare-ups of the patient's immunity underlie the prolonged reactive state, irrespective of HCV infection.

Reactional States in HIV and Leprosy Co-Infected Patients

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Leprosy reactions in patients co-infected with HIV have been reported in previous studies, showing that reactions are more frequent and worse than in non-HIV patients. At the FIOCRUZ Leprosy Clinic, a total of 55 co-infected patients (78% PB) that completed up to 10 years of follow-up were evaluated. Immune reconstitution inflammatory syndrome (IRIS) was defined as the presence of reversal reaction (RR) during the first 6 months of highly active antiretroviral treatment (HAART) together with improvement of CD4 lymphocyte levels and viral load reduction. Reaction was present in 32 (58%) patients, more frequently in PB patients (72%). RR was the most frequently observed (81%) type. Sixty percent of the patients had their first episode before WHO-MDT. Four patients had RR soon after starting HAART and fulfilled IRIS criteria. Most patients (56%) had only one leprosy reaction but it was prolonged in 93% of them. Severe episodes were also a common event observed in 71% of the patients, 7 of which required hospitalization. RR can be an expression of IRIS in co-infected patients. Co-infection increased severity and duration of reactions in this group of patients. **Keywords :** HIV-leprosy co-infection, reaction, HAART, IRIS.

Co-Infection HIV and Leprosy-Follow-Up of Seven Cases Treated at Hospital of Clinics of Federal University Minas Gerais - Brazil

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Since the beginning of human immunodeficiency virus (HIV) epidemic possible interactions between this infection and leprosy are discussed. At this moment, there is no evidence to suggest that an association exists between these infections, otherwise it has been demonstrated with tuberculosis and *Mycobacterium avium* complex infection. Co infection HIV and leprosy cases have been reported and the management of these cases isn't different of that done to immunocompetent persons. The treatment recommended is the standard MDT regimens. Eight cases of co-infection are reported. Two of them are seropositive for HIV and have BL and BT leprosy, and six cases with AIDS and leprosy, five BT and one TT. In the last group, four cases have been made the diagnosis of leprosy during the immune reconstitution inflammatory syndrome-IRIS, which was observed some weeks after beginning anti-retroviral therapy. Seven of these cases have been followed, since six to nine years, and until this moment no signs and symptoms of leprosy relapse exist. **Key-words** : leprosy, HIV, leprosy/epidemiology, leprosy/treatment.

Manifestation of Leprosy as Type-I Reaction Among AIDS Patients on HAART

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Objective : A retrospective analysis of clinical profile, laboratory investigations, treatment and overall outcome of case series of 6 patients, presenting with leprosy as Type -I reaction in acquired Immunodeficiency syndrome (AIDS) patients initiated on highly active anti-retroviral therapy (HAART). **Observations** : Immune reconstitution or restoration on 6 severely immunosuppressed HIV patients following Highly Active Anti-Retroviral Therapy (HAART) represented with leprosy as type-1 reaction. All of 6 cases were never diagnosed and treated earlier for leprosy. The cases were documented with clinical photographs. All the patients were subjected to 6 monthly CD4 testing, other laboratory parameters and initiated on Anti-retroviral therapy as recommend by NACO. **Discussion** : The *M. leprae* could have coexisted with *M. tuberculosis* in a sub-clinical form even before exposure to single drug (R), later presenting as an active form in the form of IRIS because of inadequately treated leprosy. The lessons learnt and message conveyed here is proper screening for leprosy is essential before initiation of anti-tuberculosis therapy. Concomitant occurrence of multiple diseases like TB, Leprosy and HIV is possible. The treating Physician should be clinical astute, have a broad outlook and thorough knowledge with the treatment guidelines as per the national programmes of respective diseases. **Key words**: leprosy and HIV, leprosy and AIDS.

Leprosy and HIV Two Case Presentations

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Case 1: A 64 years old male HIV case; one month after starting HAART developed weakness and numbness of the extremities and rheumatic pain. Had edematous face, hands, and feet, with enlarged and tender (3+) ulnar, median, common peroneal and posterior tibial nerves. No skin patches the SSS was negative. VMT; weakness (grade 2) of ulnar, median, and lateral peroneal nerves. CD4 count was 270 at the start of treatment, which rose latter to 503. Diagnosis; MB leprosy with sever RR, started on prednisolone and MDT/MB. The edema resolved and the nerves recovered from weak (2) to strong (4-5), with partial recovery of sensation hands and feet. **Case 2**: A 39 years old, female HIV case; developed swelling of the face and multiple erythematous painful lesions five months after HAART. Had swollen face, hands, and feet with multiple erythematous plaque lesions. The ulnar and median nerves were enlarged and tender (2+) bilaterally. VMT; normal with loss of sensation R sole, SSS was negative. CD4 count was 175 at the start of treatment, which rose to 503 latter. Diagnosis; MB leprosy with sever RR started on prednisolone and MBT/MB. The reactional lesions subsided and had full recovery of nerves by the end of treatment. The two cases demonstrate that HIV causes sub clinical leprosy to become overt by inducing reactions due to the immunological changes that follow the treatment (HAART).

Differential Diagnosis of Leprosy Neuropathy : The Role Electromyography (EMG)

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Introduction : Leprosy diagnosis is generally done by clinical examination, but for some differential diagnosis of its neural form it is necessary a more specific neurologic evaluation performed by EMG. **Methods :** Medical records were recovered from AECAR patients diagnosed with non leprosy neuropathy from 2005 to 2007. **Results :** The following 6 differential diagnosis were observed after clinical and neurological examination, biochemical tests, bacilloscopy and EMG: Amyotrophic lateral sclerosis (1), Syringomyelia (1), Depuytrain Disease(1), hypothyroidism neuropathy(1), e latent tetania neuropathy (1), Syndrome canal Guyon (1). **Conclusion :** Even considering that leprosy still has high prevalence in Brazil, it is important to consider all other possible differential diagnosis. EMG is fundamental to initiate the investigational process of other neuropathies.

Keywords : Leprosy- other neuropathies- electromyography.

Evaluation of Simplified Tests for the Diagnosis of Nerve Function Impairment in Leprosy : The Sensory Motor Screening (SMS) Study

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Introduction : Simple tests for diagnosing nerve function impairment in leprosy are required in integrated settings. We examined whether simplified tests performed by inexperienced general health workers (GHWs) have reasonable diagnostic accuracy compared to the reference test conducted by physiotherapists. **Methods :** We compared three simplified tests, ILEP Learning Guide 2 (M2), Indian dance (M3), and a questionnaire (M4) with the full assessment (M1) as the reference. We included 388 newly detected people with leprosy from seven different centres in India. All 388 people were tested with M1. 271 people underwent M1 and M2, 222 people were tested with M1 and M3 and 278 people were examined with M1 and M4. Sensitivity (Se) and specificity (Sp) were calculated. **Results :** Preliminary results suggest that M3 is the best method for sensory testing of the feet (Se 72%, Sp 92%), M2 is the best method for sensory testing of the hands (Se 72%, Sp 96%), M4 is the best method for finger-out testing (Se 72%, Sp 86%), M2 is the best method for thumb-up testing (Se 75%, Sp 93%), and M4 is the best method for foot-up testing (Se 75%, Sp 97%). We will present more detailed results at the congress. **Conclusions :** There is a future for the use of simplified methods to detect nerve function impairments by GHWs in India. **Keywords :** leprosy, diagnostic tests, nerve function impairment

Dilemma of Diagnosis in Leprosy

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Introduction : Diagnosis of leprosy though not difficult in most cases, do require some expertise before confirming the same. We present here two such cases seen by us, during last year at the Foundation for Medical Research, Worli, Mumbai who were misdiagnosed else where and received anti leprosy treatment, only to be realized that they never had leprosy. **Case reports :** 1st case : A 25 year old female with multiple hypo pigmented, non-anesthetic patches over the body developed since one year, initially received tropical steroids. Later histopathology done at a private clinic gave a diagnosis of indeterminate type of leprosy. She was put on Ref +OLF daily for 1 month but showed no improvement. Biopsy repeated at FMR, proved it to be a case of hypo pigmented mycosis fungoides (confirmed by a dermatopathologist). 2nd case : A 15 year old girl who had constant blisters and ulceration of left ulnar two fingers since the age of two, 10 years down the line developed claw deformity of these two fingers. She was put on MDT in the year 2006 for 6 months. Recently, she was seen at the FMR clinic where a detailed history, NCV and nerve biopsy were done. The findings did not confirm leprosy. She was eventually diagnosed to be a case of brachial plexus injury sustained at birth (confirmed by a neurologist). **Conclusion :** These cases highlight the need for a proper elicitation of history, careful clinical, bacteriological and neurological examination and when in doubt a biopsy of the affected tissue which are contributory to an accurate diagnosis. **Key words :** Leprosy, diagnosis.

Vasomotor Reflex Alteration and PGL-I Antibodies Aid The Early Diagnosis of Leprosy

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Early detection of leprosy remains one of the major challenges in the control of the disease. Dysautonomy occurs in leprosy neuropathy and indicates early nerve lesion. On the other hand, the presence of anti-PGL-I antibodies has been considered as a measurement of disease in contacts. At the Leprosy Clinic, FIOCRUZ, Rio de Janeiro, active leprosy detection is performed by contact vigilance. A group of 25 co-prevalent cases (ie. contacts with leprosy on their first evaluation following their index case diagnosis) was evaluated. A high prevalence (20%) of both altered skin vasomotor reflex (44%) and presence of anti-PGL-I antibodies (46%) was observed on diagnosis. All of the patients were PB (diagnosed as indeterminate or borderline-tuberculoid), and such a pattern is not expected in this group of patients. Studying autonomic alterations in leprosy patients and their contacts has provided with new information to explain the evolution of leprosy neuropathy. Contact examination is fundamental for early detection of leprosy.

Magnetic Resonance Imaging Used for Diagnosing Osteomyelitis in Leprosy Patients with Neuropathic Feet with Clinical Signs of Mild Inflammation

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Introduction : The aim of our study is to find out if osteomyelitis is present in of leprosy patients with neuropathic feet with longstanding ulcers and/or localized cellulitis. **Methodology :** All patients underwent a valid MRI protocol as described for diabetic and leprosy patients. **Results :** Fifteen neuropathic feet from 9 patients were included. The forefoot was predominantly affected clinically and on MRI. Clawtoes, bone absorption in the forefoot and soft-tissue abnormalities diagnosed clinically were confirmed by MRI in 100%. Cellulitis diagnosed clinically was confirmed on MRI in 33% of the cases. Although these neuropathic feet were clinically not suspected for osteomyelitis, MRI signs for osteomyelitis were found in 27 % of the feet. In 75% of the feet with osteomyelitis there was a superficial ulcer and in 75% of the feet with osteomyelitis there were clinical signs of localised cellulitis. **Conclusion** A striking discrepancy between clinical and MRI findings was found. This study shows that, compared to clinical evaluation, MRI is a more sensitive method to detect osteomyelitis in neuropathic feet longstanding ulcers and/or cellulitis. MRI findings in these patients may influence decision making during the follow-up since osteomyelitis requires a more aggressive medical approach in order to prevent further complications. **Key words :** leprosy, neuropathy, imaging, osteomyelitis.

A Comparative Clinical Trial in Multibacillary Leprosy with Long-Term Relapse Rates of Four Different Multidrug Regimens

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As a participant in a WHO multi-center trial, we evaluated the relapse rate in 189 multibacillary (MB) leprosy patients (a smear Ble⁺2+) treated in Cebu, Philippines, double-blind with four different regimens and followed-up annually for as much as twelve years after the initiation of therapy. Treatment regimens included one-year WHO-MDT, two-year WHO-MDT, one month of daily rifampin and ofloxacin, and one-year WHO-MDT plus initially the one month regimen. Either the appearance of new skin lesions or an increase of BI at any smear site suggested relapse which was confirmed by an outside leprosy expert, histopathology, and *M. leprae* mouse viability. In the three groups who received WHO-MDT relapses occurred in only 2/132(2%) at nine years and 2/81(3%) at twelve years, while the one month regimen resulted in significantly greater (p<0.006) relapse rates, respectively 7/64(11%) and 10/40(25%). Relapses occurred late, beginning at five years and were confined to BL or LL patients with an average Ble⁺2.6. *M. leprae* in relapsed patients consistently grew in mice, one each being resistant to only low-level dapsone, clofazimine and rifampin. Alternative short-course regimens will be discussed. **Key Words:** Multidrug Therapy (MDT), Multibacillary (MB) Leprosy, Relapse, Double-blind Trial

Evaluation of the Effect of Addition of Immunotherapy with *Mw* Vaccine to Standard Chemotherapy in Borderline Leprosy

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This trial has been initiated to assess the additive effect of immunotherapy with *Mycobacterium w* (*Mw*) with standard MDT in borderline leprosy. In case of borderline leprosy there is presence of reactive episodes and persistence of lesions. A total of 150 cases (BT-61, BB-54, BL-35) in the trial limb plus 100 as a control (BT-44, BB-36, BL-20) have been included in the study. Detailed clinical examination, charting, smear examination of all untreated borderline cases and controls was done, biopsies were taken from the active lesions of all cases and controls at start of therapy of every six month thereafter till the completion of therapy. Standard MDT was given to all the cases and controls according to type of disease. *Mw* 0.1ml (0.5x10⁹ bacilli) was injected intradermally at the start of therapy and every six month in addition to chemotherapy to all the cases. Follow-up is being done with respect to the local reaction, incidence of reaction, clinical parameters like size of lesion, erythema, infiltration, sensory improvement, and histopathologically to see the granuloma clearance. The BT cases were followed up after 6 doses of MDT and 2 doses of *Mw* vaccine. In them more than 85% improved clinically, no incidence of reaction occurred as compared to controls where clinical improvement was slower in all parameters and five controls show the occurrence of reaction. The BB, BL cases were followed up after 5 doses of *Mw* vaccine plus 24 doses of MDT in them also more patients clinically improved as compared to controls (24 doses of MDT only) where clinical improvement in all parameters was slower. Histopathological comparison of regression induced by chemotherapy alone with that induced by combining immunotherapy, also showed a greater reduction in granuloma fraction with the latter, in BT cases as well as in BB/BL cases. The reduction was more marked when the initial granuloma fraction was high. While rapid decrease in granuloma fraction was observed in BT cases following 2 doses of *Mw* vaccine plus MDT as compared to controls (MDT only) initially, the response was comparatively slower afterwards. Progress appears to be similar in pediatric as well as adults together showing the potential usefulness of the approach in treatment of borderline leprosy cases.

Management of ENL : Patient Characteristics and Treatment Outcome of 94 Patients Treated with Prednisolone and/or Thalidomide

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This retrospective study explores demographic and disease specific parameters of patients treated for ENL with prednisolone only or prednisolone in combination with thalidomide (n=47) and compares treatment outcomes. Severity of ENL was assessed with the Reaction Severity Scale (RSS). **Results** : Thirty Percent presented with ENL at the time of diagnosis; 41% developed ENL reaction in the first year of MDT. High RSS-scores correlated with a longer duration of treatment. The frequency of symptoms in the different age groups was compared. Older patients were more likely to develop oedema and the incidence of fever was higher in ENL patients between 20-39 years of age. Severity of ENL symptoms in the prednisolone only group was less than in the prednisolone and thalidomide group (p=0.003). Duration of symptoms in the latter group was longer (p<0.001). **Discussion** : Characterisation of (sub) groups of patients with ENL is essential in prospective studies to better evaluate the efficacy of drug treatment.

Thermal Sensation and Vibrometry Perception Assessment for Neuropathy in Patients with Leprosy

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Introduction : The use of more sensitive assessment tools of nerve function may improve early detection of nerve damage. This study was done to establish normative data and evaluate vibration perception testing and thermal sensation testing for neuropathy in leprosy patients. **Methodology** : During the INFIR Cohort study in North India, 303 multibacillary patients were followed prospectively for two years during treatment. Regular assessments of nerve function were taken by testing monofilament threshold, voluntary muscle test score, vibration and thermal sensation, and also motor and sensory nerve conduction studies. Normal ranges of nerve function were collected from healthy, non-neuropathic subjects. These values were then compared with those from the leprosy patients at entry in the study. **Results** : Reference data was calculated separately by age and sex of the patient, which were found to be significant determinants of test results. Vibration perception thresholds, as well as thermal sensation testing, were sensitive in identifying individuals with nerve impairment at initial examination. **Conclusions** : Functional tests appear to be effective indicators of early onset of nerve damage. Further data will be reported on key testing sites and baseline status as a predictor of neuropathy. **Key words** : peripheral neuropathy, nerve assessment, reference values.

Staging Nerve Function Impairment in Leprosy – Analysis of Data from the INFIR Cohort Study

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Dyck¹ demonstrated that the relative frequencies of nerve impairments could be used to describe the progress or stage of diabetes. Using data from the INFIR Cohort Study we explored the staging of impairments in leprosy. Nerve status among 303 newly-diagnosed MB patients was assessed clinically and using measures of sensory and motor nerve conduction, thermal sensation and vibration perception. We then compared the frequency of impairments within nerves and the frequency of impairments across nerves. Findings are illustrated using data on 279 right posterior tibial nerves.

Right posterior tibial nerve

Number of impaired functions	N	Enlarged	Impaired warm sensation	Impaired cold sensation	Loss by monofilament	Impaired vibration perception
0	43	0.0	0.0	0.0	0.0	0.0
1	73	80.8	9.6	4.1	0.0	5.5
2	61	75.4	57.4	24.6	18.0	24.6
3	37	78.4	86.5	64.9	21.6	48.7
4	28	78.6	92.9	85.7	82.1	60.7
5	37	100.0	100.0	100.0	100.0	100.0

We found enlargement to be the most common form of impairment, followed in turn by loss of warm sensation, loss of cold sensation, monofilament loss and loss of vibration perception. The suggestion is that nerve enlargement is earliest to develop, followed by loss of warm sensation. Loss detected by monofilament is relatively late in the process. Similar analyses have been completed for ulnar, median, radial cutaneous, lateral popliteal and sural nerves, some of which were assessed using nerve conduction. The analysis comparing onset across nerves indicates early involvement of lower limb nerves. Overall, our findings identify a need for nerve function tests that are more sensitive to early changes in nerve function.

Case Studies from the INFIR Cohort Study

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Describing the relationships between clinical, neurological and serological measures was fundamental to the INFIR cohort study. The objective of the study was to evaluate such measures as indicators of early change in nerve function among newly diagnosed cases of MB leprosy. During the course of a two-year prospective follow-up, some 7000 data items were recorded for each patient. Additional studies provided normal reference values for nerve conduction, thermal sensation and vibration perception thresholds. The challenge was to summarize the data in a way that illustrated its complexities and supported comparisons between individuals and groups. The chosen approach was to chart changes over time in each of the neurological and serological measures and contrast these with clinical data on changes in nerve function and reaction status. An automated system was used to produce a series of charts for each of the 303 patients in the study. The presentation will use these charts to describe the follow-up experience of selected cases from the INFIR study and illustrate and contrast the follow-up experience of key patient groups. The charts have potential as an educational tool and may be used to monitor changes in nerve function.

Risk Factors for Neuropathy Measured at Diagnosis and Before Events: Results from the INFIR Study

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Understanding of the risk factors for neuropathy in leprosy contributes to appreciation to the mechanisms of nerve damage and promotes awareness in high risk patients. This study assessed risk factors at diagnosis and before events in a cohort of 303 previously untreated multi-bacillary leprosy patients. 115 have recent events at diagnosis and 188 were followed up monthly for 24 months during which time 39% development new events, 54 of included nerve injury. Age, nerve enlargement and number of lesions were important clinical factors predicting future nerve damage. Changes in sensory nerve conduction at diagnosis were strongly predictive for new events but less so for motor nerve conduction changes. Changes in both motor and sensory nerve conduction and in TNF- α were demonstrated to precede new events. These findings contribute to our understanding of nerve function impairment in leprosy.

Comparing Diagnostic Tests of Neuropathy in Leprosy in the INFIR Cohort Study

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Introduction : Every year, thousands of patients develop permanent peripheral nerve damage as a result of leprosy. We conducted a cohort study to determine which test detects this neuropathy earliest. **Methods :** 188 MB leprosy patients were selected from a cohort of 303 in two TLM India hospitals in Uttar Pradesh, followed for two years after diagnosis. Nerve function was evaluated at each visit using nerve conduction (NC), thermal sensory testing, vibrometry, dynamometry, monofilaments and voluntary muscle testing (VMT). Study outcomes were sensory and motor impairment detected by monofilaments or VMT. **Results :** 74/188 patients (39%) had a reaction, neuritis or new nerve function impairment (NFI) event during follow-up. Sub-clinical neuropathy was extensive (20-50%), even in subjects who did not develop an outcome event. Sensory NC amplitudes, motor NC velocities and warm detection thresholds were most frequently affected, with SNC impairment frequencies ranging from 30% (median) to 69% (sural). Velocity was impaired in up to 43% of motor nerves. WDTs were more frequently affected than cold detection thresholds (29% vs. 13%, ulnar nerve). Impairment of SNC and warm perception often preceded deterioration in MF or VMT scores by 12 weeks or more. **Conclusions :** A large proportion of leprosy patients have sub clinical neuropathy which was not evident when only monofilaments and VMT were used. SNC was the most frequently and earliest affected test, closely followed by WDT. They are promising tests for improving early detection of neuropathy. **Keywords :** leprosy, nerve conduction testing, peripheral neuropathy, reactions, thermal sensation.

Nerve Recovery in Leprosy - Results from the INFIR Study

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Introduction : The INFIR cohort studied nerve function recovery prospectively over two years. **Methodology :** Multibacillary leprosy patients newly treated with standard multidrug therapy. Reversal reaction or neuritis was treated with Prednisone, 40 mg/day, tapered over 3 months. Nerve function was assessed with monofilaments, voluntary muscle testing, sensory and motor nerve conduction, vibration perception thresholds, and warm and cold detection thresholds. Follow-up was monthly in the first year and two monthly in the second year. **Results :** 303 subjects enrolled, 188 were followed for two years and of these 74 had either a reaction or neuritis at registration or developed either of these during follow-up. Subclinical neuropathy was common. Statistically significant improvement for clinical parameters over 12 months follow-up became clinically relevant only in those presenting with acute new onset ulnar neuritis. Best nerve function improvement was seen for sensory amplitudes followed by motor amplitudes and by vibration perception. Latency and thermal perception thresholds showed least improvement with warm detection showing little to none. Those treated with Prednisone showed greater improvement of all nerve parameters which peaked at around 10 months. In contrast the response to MDT was more linear and continuous up to 12 months. **Conclusion :** This study suggests that measures of large nerve fibre function improve better than those of small nerve fibres. Overall best nerve function improvement was in the posterior tibial, the least in the sural nerve. **Keywords :** Leprosy, nerve conduction testing, neuritis, thermal threshold testing, vibration threshold testing, small nerve fibre, large nerve fibre, Prednisone.

Leprosy Skin Tests : Field Testing of Two New Agents in a Country Endemic for Both Leprosy and Tuberculosis

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Introduction : As the load of leprosy decreases, the need for new tools to augment clinical diagnosis becomes more pressing. Differentiation between infection with/ exposure to *M. leprae* and *M. tuberculosis* remains problematic. **Methods :** We have identified two new antigens; MLCwA (*M. leprae* cell wall antigen) and MLSA- LAM (*M. leprae* soluble antigen depleted of LAM) which have shown promise to differentiate between leprosy and TB exposure in the guinea pig model. Following a successful Phase I trial, we are undertaking field testing in suitable human volunteers in Nepal in a double blinded Phase II randomised control trial. Subjects were recruited in 4 groups: leprosy patients, household/ professional contacts of leprosy patients, healthy non- contacts (endemic controls) and TB patients. All subjects received intradermal injection test antigens plus appropriate control antigens. Induration and erythema were measured at 3, 7 and 28 days post injection. **Results :** Comparison between test antigens and PPD (positive control) indicate that these antigens differentiate between leprosy and TB exposure in an endemic setting. **Key words :** field testing of MLSA-LAM.

A Case of Relapse of Leprosy Presenting as Generalized Lymphadenopathy, 20 Years After RFT

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Introduction : In India number of MB patients were treated with MDT-MB and released from treatment (RFT). It is expected that a very small but significant fraction of these patient might relapse. We are presenting a case of Bacteriological relapse of LL which was made RFT 20 years back, presented with ENL along with Generalized lymphadenopathy which was mistaken for a case of Tubercular lymphadenopathy and treated without response. **Case summary :** A female of 40 years presented with ENL lesions on the extremities and bilateral cervical lymphadenopathy to our clinic. She gave a past history of having completed MDT- MB at a leprosy hospital, Hyderabad and made RFT in the year 1985. Patient also gave a history of recurrent ENL reactions on and off over last several years and was on oral corticosteroids for the treatment of ENL. In the year 2006, she developed Generalized Lymphadenopathy, with most prominent being cervical lymph nodes. A diagnosis of Tubercular lymphadenitis was made based on the cervical lymph nodes FNAC. Patient was on 6 months of anti TB treatment, however, did not respond to the therapy. With this background we investigated this patient and performed skin biopsy, skin smear for AFB and FNAC from lymphnodes, which was sent for cytology and culture for *M. tuberculosis*. Skin biopsy revealed Lepromatous leprosy and skin smear was 3+ for AFB. The cytology of FNAC from the lymph node showed loaded AFB on modified ZN stain. A diagnosis of Lepromatous leprosy with bacteriological relapse was made based on the above findings. **Discussion :** The persistent occurrence of ENL even after 20 years of RFT done at smear negativity, made us suspect relapse. This made us to investigate thoroughly with regard to relapse and rule out tuberculosis. Although in the modified ZN staining of FNAC, it is difficult to differentiate between Lepra and Tubercular bacilli, the skin smear positivity of 3+ in this patient pointed towards the relapse of leprosy. **Conclusions :** We are presenting this case for the atypical presentation of relapse of leprosy mimicking tubercular lymphadenopathy, in a patient treated till smear negativity with MDT-MB about 20 years back. **Acknowledgements:** We acknowledge the help of Director and staff of Lepira India- Blue Peter research center, Charlapally, Hyderabad, India,.

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The Importance of the Correlation Between the Patients' Complaints and Their Detailed Physical Examination in the Evaluation of Patients with Leprosy Who Simulate Complications in Order to Achieve Secondary Benefits - A Report of Three Cases

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This paper is a case report of three patients from the Eduardo de Menezes Hospital – State of Minas Gerais' Hospital Foundation – Leprosy Ambulatory. The cases have in common the discordance between the patients' complaints – pain, loss of sensation, weakness – and the evidences from their detailed physical examination, and they show the latent relation between leprosy and the search for secondary benefits through the National Institute for Social Security. In the three cases, the medical staff believed in simulation in order to achieve or perpetuate an insurance benefit. The work focuses on the fact that the intimate relation between the patient's complaints and the physical examination is due to the disease pathogenesis and is crucial to guide the staff's decisions. Not only by helping to identify those people attempting to get the secondary benefits, but also allowing the opportune treatment of the leprosy complications and avoiding unnecessary treatments, it's adverse reactions and public costs. It will always be difficult to doubt a patient's complaint. But, on the other hand, being loyal to the detailed physical examination findings is the best way to offer the patients a chance to overcome the stigma that they have created about their own condition.

Keywords : leprosy, secondary benefits, physical examination

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Averting Childhood Leprosy Deformities-weaknesses in Present Integrated System-Presentation of a Child Case from Maharashtra, India

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Ahmednagar one of the largest district of Maharashtra shows a PR of just 0.2/10,000 , there are no deformity cases reported among N.C.D for last two years. ShanthiKumar (name changed) a 9-year old male was detected as MB leprosy with no deformities on 04/07/2006 & RFT on 04/06/2007, as per PHC register, which also shows record of three more MB adult cases.. As per NLEP Records 2006-07, Only one MB adult case from Chichodi Patil PHC during 2006-07. (What about the other three cases?) There are no child cases in the Chichondi Patil PHC, for 2005- 06, 2006-07. The Deformities Cases for the Ahmednagar block for 2006-07 is 0 The PHC shows a PR of just 0.77/10000. The child's name figures nowhere in the NLEP records. The child has received just two months MDT in July & August 06 & has developed a grade 2 deformity right hand! **Weakness in the present integrated system :** 1. As individual attention cannot be given because one PMW looks after a large area hence some patients may be left out & not be monitored regarding treatment. 2. Leprosy is not the first priority & takes a back seat. 3. Medical officers are transferred frequently.

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Clinical Profile of Leprosy in Urban and Semi-Rural Field Areas

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Introduction : A retrospective analysis was undertaken to study the trends and the risk factors for ENL (Erythema Nodosum Leprosum) in smear positive MB (multi bacillary) cases for the period of 1991 to 2000 from LEPRO field projects of Andhra Pradesh and Orissa. **Methodology :** A total number of 14,338 MB cases were analyzed. Of these 3,923 were smear positive. **Results :** Percentage of smear positivity was similar in all the field areas except in one urban area. Maximum numbers of smear positive patients were in the age group of 20 to 49 yrs (44.8%). Males predominated over females across all the age groups. Types of leprosy remained the same in each age group. An increase in LL type was observed with advancing age. Delay in presentation at clinic influences leprosy type, bacteriological index and involvement of truncal nerves. 8.7% of the patients had ENL. **Conclusion :** Gender, age, LL, infiltration, bacteriological index, and delay in presentation were observed to be significant risk factors for ENL. **Key words :** Multibacillary (MB), ENL, Smear positive, truncal nerves.

Presence of *Mycobacterium leprae* in the Central Nervous System of Leprosy - A Probable Cause of Silent Neuropathy

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Peripheral neuropathy has been extensively studied in leprosy, but the central nervous system (CNS) was regarded to be free from *Mycobacterium leprae*. Involvement of the CNS was evaluated in autopsy cases of clinically cured lepromatous leprosy (n=67) and in non-leprosy control cases (n=10). Paraffin sections of the medulla oblongata and spinal cord were stained by H&E, Fite's acid-fast staining, and *M. leprae*-specific anti-phenolic glycolipid-1 (PGL-I) immunohistochemistry. PGL-I-positive areas were micro-dissected from selected cases and nested PCR targeting the *M. leprae*-specific repetitive sequence (RLEP) was performed. Of the 67 cases of leprosy, 44 (67%) had vacuolar changes of motor neurons either in medulla oblongata (nucleus ambiguus, hypoglossal nucleus) or spinal cord anterior horn. Fite staining was negative, but PGL-I was positive in vacuolated areas. Nested PCR revealed *M. leprae*-specific genomic DNA in 18/19 of cases (95%) with vacuolated changes and 5/8 (63%) without vacuolated changes. All above findings were negative in control cases. Damage due to *M. leprae* in the CNS of leprosy could elicit motor paralysis and may participate in the pathogenesis of silent neuropathy. (This study was conducted in collaboration with Thida Aung, Shinichi Kitajima, Mitsuharu Nomoto, Suguru Yonezawa, and Isao Arikawa.).

Serology Can be Used in Leprosy Control to Aid Classification and Predict Nerve Function Impairment

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Anti-PGL-I IgM seropositivity reflects the systemic bacterial load of leprosy patients. It aids the diagnosis and classification of leprosy patients and can be used to predict nerve function impairment (NFI). Despite this, serology is still not used in routine practice, possibly due to perceived lack of applicability and costs. Here we provide strong evidence that serology is valuable for and can be used in routine leprosy control. 1037 new leprosy patients were included in a prospective cohort. The relation between clinical and demographical variables and seropositivity was calculated and the test potential to predict NFI was determined using survival analysis. The number and extent of clinical signs as well as sex, age, disability grade, bacterial index and classification all correlated with seropositivity. The size of skin lesions was positively correlated with seropositivity. We did not find different levels of seropositivity among patients with one or two skin lesions, nor did we find different levels among patients with or without satellite lesions. We propose a NFI prediction rule, using classification and serology results, which could predict 80% of all NFI events in our cohort.

Correlation of Skin and Nerve Histopathology in Leprosy

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Leprosy is a chronic disease caused by *Mycobacterium leprae* affecting the peripheral nervous system, skin and certain other tissues. Studies have been done in which concurrent skin and nerve biopsies were obtained. Disparities were noted in the histopathological features of nerves compared to skin biopsies of the same patient. The objective of this study was to correlate and compare the nerve and skin histopathology in different types of leprosy. 27 untreated patients who were clinically diagnosed of having leprosy were included in this study. The skin and nerve tissue sections were stained with H&E and Fite-Faraco stains. Correlation between skin and nerve histopathology was seen in 12 out of 27 cases while discordance was seen in 12 out of 27 cases. In 9 cases, nerve showed lower histological grade than skin. It is because nerves are immunologically protected sites. So there is delayed recognition of *M. leprae* in nerves. In 3 cases, nerve showed higher histological grade and was less bacillated than skin. It may be due to micro reactions occurring in the nerves. **Keywords :** Skin, Nerve, Histopathology, Leprosy.

Assessment of Nerve Function Impairment in 400 Untreated MB Cases Using Clinical Tests i.e. MNP, MF, VMT and Electrophysiological Test Findings A Correlative Study

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Objective and Study design : To examine the field reliability of clinical testing in comparison to electrophysiological measures of nerve involvement in untreated leprosy cases. Four hundred untreated MB cases recruited for a larger prospective cohort study were subjected to neurological assessments which comprised of: manual nerve palpation (MNP), sensory testing using monofilaments (MF), voluntary muscle testing (VMT) sensory and motor nerve conduction velocity parameters (SNCV and MNCV). Nerves assessed were bilateral ulnar (sensory and motor), median (sensory and motor), radial cutaneous, sural, common peroneal and posterior tibial. Analysis was performed using SPSS version 10.0. The significance of association was tested using Chi square test. Results: On comparison of MF and SNCV, good to very good correlation (i.e. 1:1=N-N & Ab-Ab) was seen in 65% of nerves. For all the nerves, specificity of MF with SNCV was higher (>80%) as compared to sensitivity. The sensitivity was high for ulnar nerve (44%) followed by radial (39%), sural (36%) and median (35%). On comparison of VMT with MNCV, a 1:1 correlation was seen in 67% nerves. For all nerves, specificity of VMT with MNCV was >90% while sensitivity was maximum for ulnar nerve (25%), but low (4-5%) for all other nerves. On comparison of MNP with (SNCV & MNCV), a 1:1 correlation was seen in 67% and 77% nerves respectively. For ulnar and c.peroneal nerves, the specificity was low (30-40%) as compared to other sensory and motor nerves (60-80%). The sensitivity was higher than specificity for all the nerves and maximum for ulnar nerve (>90%). Percentage of cases showing nerve involvement by 3 combined clinical tests was 91% that was closely comparable to NCV test findings (93%). **Conclusion :** Both MF and VMT are very specific for detecting nerve function impairment, but less sensitive as compared to SNCV and MNCV. MNP is less specific but more sensitive as compared to MF and VMT. Under field conditions, combination of the above clinical tests could serve as the most useful tool for detecting nerve function impairment.

Key words : Nerve assessment, Leprosy, Clinical tests, Electrophysiological tests, Correlation.

Leprosy - The Great Masquerader

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Introduction : Leprosy continues to be one of the great mimickers. This retrospective case series is a compilation of various misdiagnosed cases of leprosy to demonstrate its many faces. **Methodology :** Unsuspected cases which initially baffled dermatologists and other specialty clinicians with their clinical presentation and investigated extensively and ultimately proven to be Hansen's disease within a 1 year time period were compiled. **Results :** There were a total of 7 cases, the clinical presentation of which greatly mimicked other cutaneous disorders. The initial diagnoses included Systemic Lupus Erythematosus, Epidermolysis Bullosa Aquisita, vasculitis, connective tissue disease, Pyrexia of Unknown Origin, atrophic rhinitis and congestive cardiac failure. Lepromatous leprosy in type II reaction was the commonest type of leprosy to mimic other cutaneous or systemic disorders and therefore the most misdiagnosed. **Conclusions:** India being an endemic country, there exists a high index of suspicion of leprosy. However, the myriad clinical features still continue to cause diagnostic difficulty and confusion. Hence, it would be prudent to always consider leprosy in the differential diagnoses, particularly in cases that are a diagnostic dilemma. **Key Words :** leprosy, mimicker, leprosy presentation, leprosy misdiagnoses.

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Role of 18 kDa Heat Shock Protein in *Mycobacterium leprae* Infection of Macrophages

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Introduction : *M. leprae*, the causative agent of leprosy, is an obligate intracellular pathogen. In order to understand the pathogen's immunopathological mechanism and to develop effective vaccine candidates, a large number of immunodominant antigens have been identified and characterized. Our studies are aimed towards understanding the role of *M. leprae* Hsp18, a major secreted antigen, in infection. **Methodology :** The 18kDa gene along with a 168 bp upstream promoter region was PCR amplified from the armadillo derived *M. leprae* genomic DNA, cloned into pSET152 vector and transformed into *E. coli*. The expression of this 18kDa protein was analyzed by western blot analysis. Further, the expression of this protein in *E. coli* under microaerobic growth conditions and its localization was also examined. The *hsp18* gene with its promoter was integrated into the genome of the non-pathogenic *M. smegmatis*, mc²155 and the integration was confirmed by a plasmid rescue strategy. The survival of *M. smegmatis*, with and without the integrated copy of the *hsp18* gene, in the macrophages is also under study. The survival of *M. smegmatis* at different time points after infection, ranging from 3-120hrs, was assessed. **Results :** The Hsp18 protein is expressed in *E. coli* and slight enhancement of expression was seen when grown in microaerobic conditions. This protein localizes to the periplasm of *E. coli*. The plasmid rescue experiments revealed that the pSET152 vector could integrate in at least 3 different sites in the *M. smegmatis* genome. The *hsp18* gene does not seem to confer survival advantage during the early hours of infection. Data pertaining to the role of Hsp18 in the survival of the pathogen during prolonged period of macrophage infection will be presented. **Conclusions :** The Hsp18 protein is expressed in *E. coli* and gets localized to periplasm. The integrated *hsp18* gene with its promoter does not confer survival advantage to *M. smegmatis* during early hours of infection in macrophages. **Keywords :** *M. leprae*, Hsp18, integration of pSET152, *M. smegmatis*, macrophage.

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IFN - γ and TNF - α Gene Polymorphisms in Leprosy

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Introduction : The main aim of the study was to identify pro-inflammatory cytokine gene differences in tuberculoid and lepromatous types of leprosy. The specific objectives were to study Single Nucleotide Polymorphisms (SNPs) in the genes of IFN- γ downstream region (+874 A/T) and TNF- α promoter region (-308 G/A) across the leprosy spectrum. **Methodology :** Amplification Refractory Mutations System (ARMS) - PCR was performed to detect SNPs in 71 healthy controls and 102 leprosy patients in the above genes. The amplified products, 273 bp (TNF- α), 262 bp (IFN- γ) and 450 bp internal control was viewed on 2% agarose gel stained with ethidium bromide. **Results and Conclusion :** No significant association of TNF- α promoter region (-308 G/A) polymorphism was observed with leprosy. There was a significant association of high producer genotype (TT) of IFN- γ gene with tuberculoid leprosy and low producer genotype (AA) with lepromatous leprosy. **Key words:** leprosy, ARMS PCR, TNF- α , IFN- γ , Polymorphism.

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Metalloproteinases and Pure Neural Leprosy (PNL) Nerve Fibrosis

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Metalloproteinase expression is one of the regulating mechanisms in inflammatory extracellular matrix remodeling. We studied this expression in leprosy nerve fibrosis in PNL biopsies. Groups studied: G1 - normal-looking biopsies; G2 - PNL + inflammatory infiltrate; G3 - PNL + fibrosis; and G4 - PNL + inflammatory infiltrate + fibrosis. **Results : m-RNA expression :** G2 showed higher MMP2 and MMP9 expressions than did G1 and G4. In contrast, MMP9 expression was lower in G3. TIMP1 expression was highest in G2, followed by G3 and G4. Immunohistochemical expression : G1 showed MMP2, MMP9, and TIMP1 expression in Schwann cells and axons while G2 showed MMPs and TIMP1 expression in mononuclear inflammatory cells (macrophages and fibroblasts); G3 had TIMP-1 expression in a few residual inflammatory cells. G4 expressed MMPs in SCs and axons and TIMP1 in inflammatory cells. These results suggest that the mutually opposing activities of MMPs and TIMP1 contribute to the final configuration of the fibrotic extracellular matrix in leprosy-affected nerves.

Lucio's Leprosy, Lucio's Phenomenon and the Antiphospholipid Antibody Syndrome

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Introduction : Lucio's phenomenon (LP) occurs in patients with Lucio's leprosy (LuL). For some authors the cutaneous lesions and its histopathology show an underlying thrombotic/occlusive condition, but for others, it is a leukocytoclastic vasculitis. The similarity between the cutaneous manifestations of LP and Antiphospholipid syndrome (APS), took us to investigate the relationship between these two pathological conditions. **Objectives :** to establish the clinical, laboratorial and histopathological characterization of LuL and LP; to make a correlation between the latter and APS. **Material and Methods:** seven patients with LuL and LP were included; they were submitted to clinical evaluation; detection of anticardiolipin antibodies (aCL), verifying the 2-GPI in six of them. The dependency to the coagulation cofactor histopathological exams of cutaneous biopsies of the skin were stained by hematoxylin-eosin (HE) and Fite-Faraco. **Results:** all the patients presented the features of classical LuL and LP, without signs of leprotic reaction. One patient presented physical incapacity grade 1 and six, grade 2. Seven patients presented one clinical criterium and five, one laboratorial criterium for APS. 2-GPI was positive in six patients. Four of the test of aCL dependency on presented risk factors for thrombosis. The histopathology showed thrombi in the vessels, obliteration/endothelial proliferation and thickening of the vessel wall, besides the specific features of Lucio's Leprosy. It was not found leukocytoclastic vasculitis. **Conclusions:** The clinical pattern of LuL observed in the patients of this study is identical to that described by Lucio and Latapi. The study suggest that LP could be considered APS secondary to LuL. The treatment with multidrug therapy for multibacillary patients (MDT-MB) was successful in the patients studied.

Modulation on the Expression of Chemotactic Factors in Reactional Leprosy Lesions Following Treatment with Thalidomide

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During the ENL patients show augmented pro-inflammatory cytokine levels in skin lesions and treatment with thalidomide leads to remission. In order to evaluate the expression of chemotactic factors by real-time RT-PCR, skin biopsies were collected from reactional leprosy patients lesions at the onset of ENL (n=8), and one week after thalidomide treatment (n=8). The expression of IL-8, IL-10, FOXP3, CCL2, CXCL10 and CCR5 was detected during ENL. After treatment with thalidomide (300 mg/day), it was found a reduction on IL-8, CCL2 and CXCL10 mRNA and sustained/augmented expression of IL-10, FOXP3 and CCR5 at the lesion sites. The reduction of chemotactic CCL2 and IL-8 may lead to diminished migration of inflammatory cells into the tissue. Moreover, the sustained expression of IL-10, FOXP3 and of CCR5 during treatment may well correlate with the local suppression of the immune response and reduced bacterial load at the lesion site. Evaluation of the expression of chemotactic factors may contribute to a better understanding of pathology progression during reactions and may reveal targets for therapeutic interventions. **Keywords :** Thalidomide.

Correlation Between A New Single Nucleotide Polymorphism in the Toll-like Receptor 1 Gene and Leprosy

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The TLR signaling pathway is required for protection against infectious diseases, but excessive signaling may lead to allergies and autoimmune diseases. Recently, a 1602S single nucleotide polymorphism (SNP) in the TLR1 gene was associated with abnormal trafficking of the TLR receptor to the cell surface resulting in a reduced response of blood monocytes to bacterial agonists. Remarkably, the 602S allele was associated with a decreased incidence of leprosy in a Turkish study population, suggesting that *M. leprae* subverts the TLR system as a mechanism of immune evasion. Here, we describe a study into the distribution of a previous unpublished SNP in the TLR1 gene among a study population consisting of 843 leprosy patients, 107 contacts and 544 people from the general population. The geographical location of the patients had no effect on allele frequency, but the allele frequency of the patient and contact populations differed significantly from the general population. In the patient population homozygous allele combinations were more frequently observed than expected ($P < 0.0001$). We will discuss the implications of the occurrence of this TLR1 SNP for leprosy.

Identification and Characterization of IFN- γ and TNF- α from Nine-Banded Armadillos (*Dasypus novemcinctus*)

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Nine-banded armadillos (*Dasypus novemcinctus*) are natural hosts of *Mycobacterium leprae* and they exhibit the full clinical spectrum of leprosy. Unfortunately, suitable immunological reagents have not been available to allow us to study disease pathogenesis in these animals. Recently, the whole genomic sequence of armadillos was published which is aiding development of a wide array of new armadillo specific immunological reagents. We report here identification and cloning of two prominent armadillo Th1 cytokines: interferon gamma (IFN- γ) and tumor necrosis factor alpha (TNF- α). IFN- γ cDNA was amplified from ConA stimulated PBMC and TNF- α cDNA was amplified from LPS stimulated macrophages. Both sets of primers were designed using recently available genomic contigs. These cDNA's were subcloned into pET vectors and overexpressed in *E. coli*. Biological assays confirmed functionality of both recombinant products. DnTNF- α lysed PK15, L929 and WEHI cell lines and was inhibited by polyclonal antibodies prepared against synthetic peptide epitopes of the proteins. DnIFN- γ induced Indoleamine 2, 3-dioxygenase activity (IDO) and killing of intracellular toxoplasma by armadillo macrophages. Similar to human macrophages DnIFN- γ activation did not induce killing of intracellular mycobacteria or discernable bursts of nitric oxide. Generation of immunological reagents such as these will us further elucidate the pathogenesis of leprosy.

Relationships Between Antibodies to *Mycobacterium leprae* PGL-I, LAM and Recombinant Protein Antigens in Lepromatous and Tuberculoid Leprosy Individuals

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The current serodiagnostic test for individuals with leprosy is based on antibody responses to the *M. leprae*-specific phenolic glycolipid-I (PGL-I). To further understand the relationship of antibody responses to disease state, we have examined the reactivity patterns of 50 lepromatous and 20 tuberculoid sera to PGL-I, lipoarabinomannan (LAM) and six recombinant *M. leprae* proteins. The response to Ag85 was consistently high in both patient groups, while responses to CFP-10 and GroES showed the most variability, from strongly positive to completely negative. The tuberculoid patient sera showed overall lower responses to all of the recombinant proteins, particularly in the case of GroES, where none in this group showed any reactivity to this protein. Only 25% of these same patients showed a weak response to CFP 10, while 76% of lepromatous patients showed a positive reaction to this protein. This analysis has given a clearer understanding of some of the differences in the responses, both between individuals at opposite ends of the disease spectrum, as well as illustrating the heterogeneity of antibody responses towards protein, carbohydrate, and glycolipid antigens within a group. We will attempt to determine if some of these response patterns can be correlated with a particular disease state or outcome. **Key words** : diagnostics, serology, recombinant proteins, LAM.

Mycobacterium leprae Induces Apoptosis and TNF Secretion via NF- κ B in Monocytes

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Introduction and Objectives : Leprosy is a chronic infectious disease characterized by a broad spectrum of clinical features depending on the host's immune response to *Mycobacterium leprae*. In this work we have studied the role of the ubiquitin - proteasome pathway and NF- κ B in *M. leprae*-induced apoptosis and cytokine secretion. **Methods and Results** : Flow cytometric analysis of cultures stained with Annexin V and propidium iodide showed that inhibition of proteasome and NF- κ B by MG132 or SN50 respectively, significantly reduced monocytes apoptosis induced by *M. leprae*. The evaluation of cytokine levels in the culture supernatants by ELISA showed that both proteasome and NF- κ B inhibitors significantly reduced the *M. leprae*-induced TNF secretion. Also, we observed that *M. leprae* increases p65 levels in nucleus and that NF- κ B pathway inhibitors reverts this effect. **Conclusion** : Our data are consistent with the notion that *M. leprae* is able to affect the levels of ubiquitin-conjugates in monocytes and that proteasome function and NF- κ B plays a role in apoptosis and modulation of TNF levels induced by this pathogen.

Potential Plasma Markers of Leprosy Reactions

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We assessed potential plasma markers of Type 1 Reactions (T1R) and Type 2 Reactions (T2R) in a cross-sectional study of untreated leprosy patients at the Reference Center for Diagnosis and Treatment, Goiania, central Brazil. Patients were classified by dermato-neurological evaluation, bacilloscopic index (BI) and histopathology, and plasma samples were frozen. Patients with T1R (n= 10) or T2R (n= 10) at diagnosis were matched for age, sex, and leprosy type with patients without reaction ('controls', n= 19). Cytokines were assayed using a pre-mixed human cytokine 27-plex panel (BioRad, USA). Exploratory data analysis and Mann Whitney tests were applied. Patients were mainly young adult males. Patients with T1R had BT leprosy (BI range = 0-1.5); those with T2R had LL leprosy (median BI = 3.25). Compared to matched controls, T1R patients had significantly greater IP-10 (p=0.004) and IL-6 (p=0.013). Compared to matched controls, T2R patients had significantly greater IL-7 (p=0.039) and PDGF-bb (p=0.041). No significant differences were found between reaction patients and their matched controls for other cytokines, including TNF α or IFN γ . **Conclusions** : IP-10/CXCL10, a chemokine known to attract Th1 cells to DTH sites, may be a potential plasma marker for Type 1 leprosy reactions. Funding: CNPq: Brazilian Research Council. **Key Words** : Immunopathology, leprosy type 1 and type 2 reactions.

A Study on Relationship of Host Protein and *M. leprae* Cell Walls in the Failure of Phagolysosome Process

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Introduction : The failure of phagolysosome process could be identified due to the expression profile of molecules: Rab5, Rab7 and TACO from host macrophage, and Lep-LAM and PGL-1 from *M. leprae*. The purpose of this study is to clarify the involvement of these molecules in relation to 16SrRNA *M. leprae* as a marker of viability. **Methodology** : Forty seven skin biopsy specimen from new untreated leprosy patients were examined for 16SrRNA *M. leprae* using Real Time PCR. The expression of Rab5, Rab7, TACO, Lep-LAM and PGL-1 was assessed by immunohistochemistry technique. **Results** : A significant difference (p<0.05) on the expression profile of Rab5, Rab7, Lep-LAM and PGL-1 were found between positive and negative 16SrRNA groups. A significant correlation (p<0.05) between the score of Rab5, Rab7, Lep-LAM and PGL-1 and the score of 16SrRNA were also found. **Conclusions** : These molecules have an important role in the failure of phagolysosome process in *M. leprae* infection. These result could be used for early diagnostic device and follow up treatment. **Key words** : host protein, *M. leprae*, phagolysosome.

Clofazimine-Induced Cell Death in Macrophages

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Clofazimine has been used in the treatment of leprosy at first for its antibacterial action against *M. leprae*. Later, it was also found to possess an anti-inflammatory action which makes it a very useful drug in the treatment of acute reactions, including ENL, neuritis, iritis etc. But the mechanisms are not fully understood yet. In the present study we found that the drug possessed cell death-inducing activity in macrophages. Mouse peritoneal macrophages were cultured in vitro in the presence of clofazimine for 24 hr. The cells exhibited marked decrease in metabolic activity by biochemical analysis and showed shrink in cell size under microscopic observation. Giemsa stain of the cells demonstrated nuclear condensation and fragmentation. The cell death-inducing activity of clofazimine was also observed in human peripheral blood monocyte-derived macrophages and human monocytic leukemia cell line, THP-1 cells. Moreover, human macrophages cultured in the presence of clofazimine were positively stained with annexin V prior to their death. Clofazimine-treated THP-1 cells also showed annexin V staining followed by demonstration of fragmented DNA. Enhanced caspase activity was observed in cell lysates of the clofazimine-treated cells. Collectively, these results suggest the apoptosis-inducing activity of clofazimine. There shall be a close relationship between apoptosis-inducing activity and anti-inflammatory property of the drug.

Inhibition of the Multiplication of *Mycobacterium leprae* by Vaccination with a Recombinant BCG that Secretes Major Membrane Protein-II of *M. leprae*

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To improve the potency of BCG as a vaccine against leprosy, we constructed recombinant BCG (BCG-SM) secreting Major Membrane Protein-II (MMP-II), which we identified as one of the immunodominant Ag of *Mycobacterium leprae* capable of activating T cells through TLR2. BCG-SM secreted MMP-II and the secreted protein stimulated human monocyte-derived dendritic cells (DC) to produce IL-12p70. DC infected with BCG-SM expressed the MMP-II, and more efficiently activated both naïve and memory type CD4⁺ T cells to produce IFN- γ than those infected with vector control BCG (BCG-pMV). However, naïve CD8⁺ T cells were significantly activated only by the stimulation with BCG-SM infected DC. The naïve CD8⁺ T cells were cross-primed with the secreted MMP-II, since the activation of the T cells was dependent on the expression of MHC class I, CD86 and MMP-II antigens. Further, BCG-SM efficiently produced perforin-producing T cells. Moreover, the MMP-II specific memory T cells were efficiently produced in mice inoculated with BCG-SM. A single intradermal injection of BCG-SM could confer better protective immunity than that of BCG-pMV against challenge of *M. leprae* in the mouse footpad. Taken together, these results indicate that BCG capable of secreting the MMP-II is more potent as a vaccine against leprosy. **Keywords:** Vaccine, Major Membrane Protein-II, BCG.

Toward Rational Design of a Defined Sub-Unit Vaccine for Leprosy

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We have studied the immune response of leprosy patients to identify immunogenic antigens, with the goal of rational development of a defined sub-unit vaccine to prevent leprosy. We screened a panel of *M. leprae* recombinant proteins for T cell recall responses in simple whole blood assay, using blood from leprosy patients and controls (household contacts, tuberculosis and healthy endemic controls). Upon 24 hour incubation, we found several antigens that specifically elicited IFN- γ secretion from paucibacillary (PB) patient blood, and surprisingly, IL-5 secretion from multibacillary (MB) patient blood. Based on these leprosy patient T cell responses, recombinant antigen ML0276 was tested in vaccine studies of experimentally infected mice. Vaccination promoted a strong Th1 cell response, and immunized mice did not develop the local inflammation that was observed in control mice. Furthermore, when cells from immunized mice were injected into recipient mice that were subsequently infected, transfer of ML0276 responsive cells provided protection. These results identify candidate antigens for a leprosy vaccine. **Sponsorship:** American Leprosy Mission. **Keywords:** T cells, vaccine.

Selection of Antigens for a Rapid and Objective Point-of-care Leprosy Diagnosis

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Leprosy diagnosis is currently based on clinical signs and the development of diagnostic tests remains a research priority. To identify and evaluate *M. leprae* proteins with diagnostic potential, we studied antibody reactivity using patient sera from well characterized, untreated multibacillary (MB) and paucibacillary (PB) leprosy patients and endemic controls. New *M. leprae* recombinant protein antigens were first screened by protein array. Antigens that provided the most sensitive and specific responses in protein array were then validated by ELISA. Upon confirmation of protein array results in ELISA, we performed multi-antigen print immunoassay (MAPIA) to determine antigens that were suitable for use in a rapid test format. The chimeric fusion protein, LID-1, provided the best discriminatory diagnosis of leprosy by MAPIA. When imprinted into an advanced lateral-flow technology (the Dual Path Platform (DPP™) Leprosy antibody detection assay) that can be interpreted by a digital reader, LID-1 was capable of providing an objective and quantifiable leprosy diagnosis within 15 minutes. Our findings have contributed to the development of a cheap, prototype leprosy diagnostic kit with promising discriminatory power in a highly leprosy endemic regions. **Keywords:** diagnosis, serology. **Sponsorship:** American Leprosy Mission.

Suitability of Slit Skin Smears for Molecular Detection of Strain Variation and Drug Resistance in Leprosy

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Introduction : Since *Mycobacterium leprae* is not cultivable, strain typing by methods such as Variable Number of Tandem Repeats (VNTR) analysis would help us to correlate genotypes with level of incidence, clinical state of disease, re-infection and/or relapse. The aim of the present study was to assess the suitability of slit skin smears for strain variation and drug resistance. **Methodology :** DNA was extracted from slit skin smears of Bacteriological Index (BI) 1+ to 5+. Using multiplex PCR 15 VNTR loci and 4 drug resistance determining regions in genes - *rpoB* (rifampicin), *folp1* (Dapsone), *gyrA* and *gyrB* (fluoroquinolones) were studied. GeneScan analysis detected the number of repeats for VNTRs and sequencing for the DRDR mutations. **Results :** Most conserved locus in the isolates of this study was microsatellite 27-5 while considerable variation was seen at locus (TTC)21. A codon 53 mutation in *folp1* was detected in one patient who presented with clinical relapse and BI of 2+. **Conclusion :** *M. leprae* DNA could be amplified for detection of strain variations and drug resistance from slit skin smears showing BI as low as 1+. Multiplex PCR minimized the amount of DNA required to undertake both screening for strain variations and resistance to multiple drugs. **Key Words :** Leprosy, VNTR, Multiplex PCR, drug resistance, Rifampicin, Dapsone, Fluoroquinolones,

Strain Typing of *Mycobacterium leprae* Thai Clinical Isolates by Multiple Locus Variable Number Tandem Repeat Analysis

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Multiple Locus Variable Number-Tandem Repeat (VNTR) Analysis (MLVA) has been proposed as a means of strain typing for tracking leprosy transmission. Many tandem repeats have been reported to be polymorphic with potential as genetic markers to differentiate strains of *Mycobacterium leprae*. However, the characteristics of polymorphism can vary depending on the population studied. We therefore measured the copy numbers of simple sequence repeats known as microsatellites and minisatellites, in *M. leprae* in Thai leprosy patients. MLVA at 10 loci was applied using total DNA extracts from skin biopsies. The number of alleles per locus ranged from 2-24 providing adequate strain discrimination. Microsatellite loci (TTC)21, (AT)17, (GTA)9, (AC)8a, (AC)9 are highly diverse. The minisatellites 6-7, 21-3, 23-3 and 27-5 exhibited a limited number of alleles while the *rpoT* locus was non-polymorphic. The combined use of nine VNTR loci revealed genetic diversity among 93 clinical isolates. The closely matched VNTR profiles found in household members of multicase families suggests infection through a common source. This MLVA method is thus useful for investigation of leprosy transmission in Thailand and targeted surveillance in defined communities.

Molecular Strain Typing for Microepidemiology of Leprosy in Cebu, Philippines

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Nearly 400 new cases of leprosy are detected every year within the island of Cebu. Therefore, a study was initiated to understand the transmission patterns of leprosy within this geographically isolated and stable population using modern molecular methods. Seventy untreated, newly diagnosed leprosy patients with bacteriological index >2, and their household contacts residing in Cebu for at least 6 months were recruited. Interestingly, five of these enrollees were linked by blood; 3 siblings in one family, and a mother and son pair in another family. After epidemiologic and clinical evaluation, biopsy and slit skin scrapings (SSS) from at least 3 active sites were taken from the patients and contacts showing signs of leprosy. The specimens are currently being processed for strain typing of *M. leprae* on the basis of genetic variability at multiple loci arising from variable number of tandem repeats (VNTR). To date, results indicate that SSS from a single site provides DNA of sufficient quality and quantity for strain typing at more than 13 loci by PCR and sequencing methodologies. The VNTR allelic diversity detected within this population is adequate for strain discrimination. Furthermore, preliminary results show identical *M. leprae* VNTR profiles from multiple SSS sites of a single patient. These attributes support the use of VNTR loci for short range transmission studies. The spatial and temporal distribution of strains and patients will be presented.

Implications of High Level Pseudogene Transcription in *Mycobacterium leprae*

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Transcriptional analysis of pseudogenes using an *M. leprae* genomic array and RT-PCR demonstrated that >40% of *M. leprae* pseudogenes were transcribed. This is the highest rate of pseudogene transcription documented to date. *In silico* analysis revealed that 22% of transcribed pseudogenes were within gene clusters or downstream of expressed ORFs. RT-PCR revealed that some of these pseudogenes appeared to be transcribed as polycistronic mRNAs. The paucity of stem-loop structures for transcript termination between upstream ORFs and pseudogenes and the presence of promoters upstream of some pseudogenes suggested mechanisms contributing to this high rate of transcription. Since translation of large numbers of pseudogene transcripts could impact *M. leprae*'s energy consumption without benefit to its survival, bioinformatics tools were applied to identify mechanisms of translational 'silencing' of transcribed pseudogenes. The majority of these pseudogenes (73%) lacked translational start codons, strong Shine-Dalgarno sequences (SD), had multiple 'in-frame' stop codons and possessed high Ka/Ks ratios indicating lack of functionality. Very few transcribed pseudogenes possessed their own putative promoter, start codon, and strong SD, demonstrating their potential to express its protein product. Taken together, these data suggest that even though a large number of pseudogenes are transcribed in *M. leprae*, most are phenotypically 'silent'.

Development of a Rapid Molecular Viability Assay for *M. leprae*

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As a result of the inability to cultivate *M. leprae* on axenic media, the viability of a preparation, including that from biopsy materials, is often unknown for clinical or experimental purposes. Therefore, to address this we developed a 'real-time' RT-PCR viability assay for *M. leprae* based on the *sodA* gene transcript, a labile mRNA and using the previously developed RLEP DNA 'real-time' PCR TaqMan assay to normalize template for bacterial numbers. FastPrep/Trizol technology was used to purify both RNA and DNA from the same sample. When DNA and (cDNA) from rifampin-treated *M. leprae* were tested in this assay, results demonstrated that a significant decrease in viability could be seen in as little as 48 hr post treatment. Currently this assay is being evaluated to determine its sensitivity and ability to define the viability of *M. leprae* from the skin biopsies of leprosy patients pre- and post- MDT. It is anticipated that this assay will be useful as an additional molecular tool to assess the viability of *M. leprae* for experimental research and to assessment of the response to chemotherapy intervention as well as presence of persisters in relapse cases.

Cloning and Characterization of a Hypothetical Efflux Pump Gene in *Mycobacterium tuberculosis*

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Introduction : Multidrug Resistant Tuberculosis (MDR-TB) has dramatically emerged as a biggest challenge for the chemotherapy of tuberculosis and has been grown into a more deadly form Extensive Drug Resistant Tuberculosis (XDR-TB). Besides accumulation of mutations in the drug targets, multidrug efflux pumps have been reported to be one of the most important mechanisms of drug resistance. Genome sequencing of *Mycobacterium tuberculosis* has identified a number of open reading frames encoding proteins with hypothetical drug efflux function. **Methodology :** We have cloned and characterized one of these efflux pump genes (patent applied) in *M. tuberculosis* with the help of an *E. coli* - *Mycobacterium* shuttle vector. The amino acid sequence of this efflux pump is conserved among other mycobacterial species and distant homologues of the gene in *M. leprae* encode for putative transmembrane drug efflux proteins. The over-expression of the gene in the clones has been confirmed by reverse-transcription PCR as well as Real-Time RT-PCR. **Results :** The over-expression of the gene in clones resulted in an increase in minimum inhibitory concentration of ethambutol and isoniazid, when studied by resazurin microtitre assay plate method. In the presence of efflux pump inhibitors CCCP and verapamil this increase in minimum inhibitory concentration of these drugs has reverted back. **Conclusion :** The gene studied possibly has important role in conferring resistance to ethambutol and isoniazid in *M. tuberculosis*. **Keywords :** Efflux pump, *M. tuberculosis*, *M. leprae*.

Detection of Genotoxic risks in the Offsprings of Leprosy Patients who Underwent 'MDT'

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Leprosy, a chronic infectious disease caused by *Mycobacterium leprae*. Leprosy is considered to be a specific public health problem, owing to the permanent disabilities it causes as well as its social consequence such as discrimination and stigma. The different clinical presentations of the disease are determined by the quality of the host immune response. WHO recommends a protocol of multidrug therapy (MDT) effectively controls the disease, hence contributing to the global elimination program. Of the various mechanisms that influence the pathogenesis of the leprosy, oxidative stress caused by reactive oxygen species (ROS) is important. Besides the pathogenesis of the leprosy, the drugs used in MDT are also generating ROS which cause deleterious effect. There is a growing evidence suggesting that oxidative stress is believed to be associated with a host of a major disease processes. Despite the worldwide incidence and reported evidence of possible genotoxicity of components of MDT no comprehensive cytogenetic investigation has been conducted on leprosy patients and on their offspring. So this study aimed to determine the genotoxic risk in leprosy patients who are under MDT (group I) and the offspring of the leprosy patients who underwent MDT (group II). Single Cell Gel electrophoresis is a sensitive technique to detect both the DNA damage and the repair. Therefore the comet assay was used to evaluate the DNA damage and the repair in the peripheral blood lymphocytes (PBL) of the above said subjects and compared with control. The result of this study clearly indicated a significant increase in the incidence of endogenous DNA damage, DNA-DNA cross links, DNA- protein cross link in (group I) but not in (group II). The repair capacity of the PBL of group II significantly high when compare to group I. However it is lesser than the control. It is also observed that none of the confounding factors has influence on the basal endogenous DNA damage. Hence this study concludes that the DNA damage generated during the MDT is repairable and supplementation of certain antioxidants is recommended to protect the DNA damage.

Real Time PCR Based Approach for Monitoring the Effectiveness of Chemotherapy of Leprosy

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Introduction : *Mycobacterium leprae*, the causative agent of leprosy is uncultivable and hence development of new diagnostic tools, which does not depend on bacterial culture is needed for monitoring the effectiveness of chemotherapy and early detection of *M. leprae*. **Methodology :** Real Time PCR based assay was used for absolute quantification of the copy number of *hsp18* DNA and mRNA from leprosy patients. Paraffin embedded biopsy samples were optimised for the preparation of DNA and RNA. **Results :** The assay was specific, sensitive and reproducible. A reduction in *hsp18* DNA and mRNA was found during chemotherapy. Complete disappearance of *hsp18* mRNA was observed in biopsies from patients treated for two years of Multi Drug Therapy (MDT). But considerable amount of DNA could be detected even after two years of MDT. In addition we also examined the level of pathogen specific DNA and RNA in reactional cases. **Conclusions :** Our results confirm the correlation of MDT treatment and decline in the gene expression level indicating the usefulness of this simpler and safer approach to monitor chemotherapy of leprosy. However, significant amount of mRNA and DNA of *hsp18* could be detected in reactional cases and this finding raises a critical issue in the treatment of reactional cases. **Key words :** Leprosy, Paraffin-embedded tissues, Real time PCR, Multi Drug Therapy.

Distribution of *Mycobacterium leprae* genotypes in Uttar Pradesh, India

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Introduction : Although genomic analytical strategies have made a substantial impact on epidemiological studies of many infectious diseases, leprosy caused by the obligate intracellular organism *M. leprae*, has not benefited to the same extent. A primary reason is the inability to cultivate *M. leprae* and analyze whole genomic DNA directly from clinical samples, particularly for the paucibacillary form of the disease. The object of this study was to analyze the strain diversity among *M. leprae* strains from UP by targeting ten Short Tandem Repeats (STRs) as molecular markers; we measured the copy numbers of simple sequence repeats or minisatellites, in *M. leprae* from patients of Uttar Pradesh including Ghatampur area. **Methodology :** Thirty specimens including 14 biopsies and 16 slit scrapings were collected from leprosy patients across the spectrum, who attended the OPD of JALMA Agra, and from 9 villages of Model Rural Health Research Unit at Ghatampur, Kanpur. These biopsies were homogenized and DNA was extracted. STRs loci were amplified by using the primers and conditions earlier published by Groathouse et al (2004). Among these ten STRs primers and assays for three STRs were developed and standardized at JALMA. Differences in the mobility were observed in the gel electrophoresis. STRs showed good amplification in slit scrapings from PB specimens also. The copy numbers were also determined by sequence analysis. **Results :** Diversity was observed in a cross-sectional survey of strains from these 30 patients, but similar fingerprinting profiles found from the cases of nearby locations indicate a possible common transmission source. **Conclusion :** STRs as molecular markers appear to be useful for studying molecular epidemiology of leprosy in this region. **Key words :** STRs, *M. leprae*.

M. leprae Genes Expressed in Human Host as Potential Drug Target(s)

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Introduction : Differential expression of genes encoding enzymes particularly concerning metabolic pathways of mycobacteria, could be important for mining new targets to design new drugs. A gene essential for the survival, over expressed during disease with low homology with any host protein could be selected as a drug target. **Methodology :** To study active transcription of *M. leprae* genes during the active infection in the host, a partial DNA Chip (Indian Patent application No- 2012/DEL/2006 and 884/DEL/2007) for selected genes (genes encoding metabolic checkpoints and genes hypothetically related to virulence) of *M. leprae* has been indigenously developed at the institute and active transcription of 11 (6-metabolism and 5-virulence) genes of *M. leprae* were detected. Active transcription was validated and relatively quantified by Real Time RT-PCR across the disease spectrum by using standard curve generated by using 16SrRNA gene. **Results :** Among these genes *sucA*, *pyrG*, *accA3*, *purN*, *mmaA1* and *purB* related to metabolism of *M. leprae* were found to be expressed across the disease spectrum. Protein sequence as well as 3D structural homology analysis showed presence of bacterial specific region in active sites of enzymatic proteins suitable for drug interaction. **Conclusion :** *sucA*, *pyrG* and *accA3* are reported as essential genes for *in-vitro* survival of *M. tuberculosis* also, thus supposed to be more promising potential both as anti leprosy, anti TB and other broad anti-mycobacterial as well as anti-bacterial therapeutic targets due to common bacterial metabolism and high protein similarity. **Keywords :** *M. leprae*, Metabolism, DNA Chip, Drug target.

Signaling Events Involving CDK5 and MAP Kinases Play a Role in Cytoskeletal Protein Abnormalities and Nerve Damage in Leprosy

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Introduction : Our studies demonstrated that hypophosphorylation of neurofilament (NF) proteins in both human and mouse leprosy nerves precede atrophic changes in the axons resulting in paranodal demyelination. Studies in the mouse model indicated interplay between *M. leprae* antigens and host derived factors in bringing about cytoskeletal abnormalities. **Methodology:** In order to further decipher the cause to effect relationship, effect of foot pad inoculation of whole *M. leprae*, *M. leprae* antigens viz. MLSA and PGL-1 and host factors viz. NGF, and TGF- β on the sciatic nerve NF phosphorylation state was studied using Western immunoblot analysis. Secondly, NFs are substrates for phosphokinases (PK) such as cyclin dependent kinase 5 (CDK5) and extracellular signal regulated kinase 1/2 (ERK1/2) MAP kinase. Levels of these enzymes in the sciatic nerve homogenates (triton x-100 soluble fraction) were estimated using a radiometric method and γ 32p labeled ATP. **Results :** *M. leprae* as well as its antigens induced similar NF changes. Significant increase in PK activity with histone with both *M. leprae* and PGL-1 where as with anti-NGF and TGF- β there was a decrease. In case of *M. leprae*, PK activity in presence of inhibitors for specific kinases showed 1) Lack of inhibition of PK activity corresponding to CDK5 and ERK 1/2, b) Expression of stress associated kinases viz. p38 MAPK and C-jun N terminal kinase (JNK) and c) Activity for Phospho Kinase C. **Conclusions:** Down regulation of CDK5 and ERK1/2 leading to down regulation of NF phosphorylation could lead to atrophic changes in the axons of leprosy nerves. Presence of p38 MAPK and JNK activities indicate a stress response, where as PKC activity indicates regenerative inputs. We therefore propose that perturbation of MAP kinase signaling by *M. leprae* and its components might be playing an important role in the initiation of a cascade leading to axonal cytoskeletal protein abnormalities and the de- and regenerative responses in leprosy nerves. **Key words :** Leprosy, nerve damage, axonal atrophy, neurofilaments, phosphorylation, CDK5, MAP kinase. **Funding :** DST, Govt. of India.

Evaluation of Genotoxicity of Thalidomide on Bone Marrow Cells of Male Wistar / Nin Rats

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Despite of its history as teratogen thalidomide serves as a drug of choice for many inflammatory diseases. In leprosy this drug is used for the management of leprosy reactions. The immuno modulatory action by which the drug attenuates the leprosy reactions is still not fully understood. The present study is aimed to study the genotoxicity of thalidomide in male Wistar/NIN rats. Wistar/NIN rats were obtained from the National Infrastructure Facilities for Laboratory Animal Sciences at NIN Hyderabad, they were bred and maintained in the laboratory animal facilities of CLT& RI. Male Wistar/NIN rats was taken for the study. Thalidomide was obtained from the licensed leprologist of CLT& RI for drug incorporated diet preparations. Haematological and Biochemical parameters pertaining to Genotoxicology is also performed. Bone marrow is dissected and the cells extracted from the bone marrow are stained with Giemsa stain for the presence of micronuclei. Population of micro nucleated cells is enumerated in control, and experimental rats. We noticed statistically increased ($P < 0.05$) scores of micro nuclei population in experimental rats fed with higher dosage of thalidomide indicating the genotoxicity when compared to animals fed with thalidomide equal to human dosage. There was no significant alterations in the haematological and biochemical parameters in therapeutic dose fed animals. Hence it is inferred the thalidomide currently administered for therapeutic management/ maintenance dose for leprosy patients is safe. This is evidenced by the supporting haematological and biochemical parameters. **Key words :** Leprosy, thalidomide, genotoxicology, experimental study.

A New Mycobacterium Species Causing Diffuse Lepromatous Leprosy

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Leprosy Research Support – Post Genome Era” (<http://www.cvmbs.colostate.edu/mip/leprosy/index.html>) Diffuse lepromatous leprosy (DLL) with Lucio's phenomenon was originally described over 150 years ago in Mexico by Lucio and Alvarez. It is characterized by a distinctive necrotizing skin reaction in non-nodular leprosy, and affects individuals primarily in the Sinaloa and Jalisco provinces of Mexico, Costa Rica, and countries in the Caribbean. From an individual who was diagnosed with DLL at a clinic in Phoenix, AZ, mycobacteria were purified from skin lesions, lung, and lymph nodes, and DNA was isolated for genetic typing. The antibody titer to the *M. leprae*-specific PGL-I was very high (50% endpoint, 1:1,500), although reactivity to only 3 out of 6 *M. leprae* recombinant proteins indicated an unusual pattern for a lepromatous patient. Sequence analysis of genes from two individuals with DLL revealed that the 16S rRNA gene diverged by 2.1% and contained a unique sequence, while five other genes mismatched by 6-14% when compared to that of the TN strain of *M. leprae*. Phylogenetically, using evolutionary trees for a number of sequences, it appears that this mycobacterium evolved from a common ancestor with *M. leprae* that had branched off from other mycobacteria. These findings may have implications for the research, diagnosis and treatment of DLL.
Key words: diffuse lepromatous leprosy, Lucio's phenomenon, 16S rRNA.

Disease Associated Bio-Markers in Leprosy : Are We any Closer ?

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The spectral pathology of leprosy involves a complex interaction between *M. leprae* and the host immune system which is reflected in the accumulation of infiltrating cells and their products like soluble cytokines, activation molecules and antibodies in tissues and circulation. Profiling these parameters can help to identify valuable biomarkers for early detection and intervention in leprosy and reactions. The present report summarizes an assessment of an extensive panel of potential biomarkers within serum and tissues in patient populations from Indonesia, Brazil, the Philippines and the Netherlands. Although several potential markers such as the cytokines IFN- γ , the macrophage activation product neopterin and the soluble IL-6R were TNF- α found to be associated with reactions, the study raised critical questions regarding the pitfalls of present approaches in developing simple and reliable tests for early diagnosis of leprosy under field conditions.

The Use of Amplification Procedures in the Histological Diagnosis of Paucibacillary Leprosy

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The histopathology of paucibacillary leprosy, particularly in its early stages, is often non-specific and acid fast bacilli are hard to demonstrate which places severe restraints on the histopathological diagnosis and confirmation of leprosy. Augmentation of histopathological diagnosis can be achieved by the demonstration of pathogen specific antigens or nucleic acid sequences using the procedures of immunohistochemistry and *in situ* hybridization/*in situ* PCR respectively. The present study examines the role of two amplification procedures in detecting nucleic acid sequences specific to *M. leprae*. The study was performed on 40 histological sections obtained from biopsies of patients belonging to the paucibacillary group (Idt and BT leprosy), which on routine histopathological examination showed nonspecific features and were additionally, negative for acid fast bacilli. Two amplification procedures to amplify pathogen specific nucleic acid sequences were performed namely, *in situ* hybridization incorporating the nonenzymatic biotinyl-tyramide amplification system, and the enzymatic *in situ* PCR procedure. In both the procedures digoxigenin was used as the label and chromogenic detection done using alkaline phosphatase NBT/BCIP system. Positive signals were observed in 26 of the 40 (65 %) specimens studied using biotinyl-tyramide system and in 31 of the 40 (77.5 %) specimens using the direct *in situ* PCR procedure. The study demonstrates the potential role of two nucleic acid amplification procedures in the diagnosis of bacteriologically negative paucibacillary leprosy which can be performed on routinely processed paraffin sections. **Key Words :** amplification methods, histology, diagnosis, paucibacillary leprosy.

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Detection of Gene Mutations Related with Drug Resistance in *Mycobacterium leprae* from Leprosy Patients in Korea

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Identification of the presence and drug resistance of *Mycobacterium leprae* is key to the diagnosis and treatment of leprosy in non-endemic country like Korea. This study aims screen mutations on the drug target DNA such as *folP*, *rpoB*, *gyr*, and 23S rRNA. Sequences of those genes were analyzed for the 104 bacterial index positive cases out of 171 leprosy patients in Korea using touchdown PCR, single stranded conformational polymorphism. Twenty (19.2%) cases have shown the mutations in *folP* gene of dapsone-resistant *M. leprae* in which three (2.89%) cases were mutations in two genes, *folP* and *rpoB*, of multidrug resistant strains to dapsone and rifampin, and two (1.92%) cases in *folP* and *gyr* genes of resistance to dapsone and ofloxacin, respectively. Besides double mutation for *folP* gene was one case (0.96%) and for *rpoB* gene one case, respectively. There was no mutant isolates in 23S rRNA gene against clarithromycin. This result should leads to a better understanding of the status of multidrug resistant leprosy in Korea and may assist in the rapid screening of drug resistant *M. leprae* and the choice of the appropriate treatment regimens. **Keywords :** Leprosy; Drug-resistance; Multidrug therapy; *Mycobacterium leprae*; Mutation

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Development and Evaluation of a Novel Multiple Primers-PCR Amplification Refractory-Mutation System for the Rapid Detection of Mutation Conferring Rifampicin Resistance in *rpoB* Gene of *Mycobacterium leprae*

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There is an urgent need for a simple method which can detect rifampicin resistance in clinical isolates. Here we develop and propose a Multiple primers-PCR Amplification Refractory-mutation System (MARS), a simple, reliable, and economic method for clinical specimens that allows the rapid detection of mutation in the nucleotides of the codon for Ser425 to Leu, Met, Phe of the *M. leprae rpoB* gene associated with rifampicin resistance. The approach involves a multiple primers PCR in which both mutant specific and normal sets of primers are included in reaction. The mutant specific primer is complementary to the corresponding sequence of the wild-type gene except for one additional deliberate mismatch near the 3'-OH terminus.. The assay was successfully evaluated using a panel of plasmids and *M. leprae* reference strains carrying the wild type or known *rpoB* mutations. It was applied to *M. leprae* DNA extracts from skin biopsies taken from patients and all were found to be wild type for Ser 425. **Key words :** gene mutation, resistance gene, rifampicin resistance.

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Detection of Mutations In *RpoB* and *FolP1* Gene of *M. leprae* Using Molecular Methods

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Molecular tools for rapid detection of drug resistance in *M. leprae* have been well established. A study was undertaken to determine the drug susceptibility of *M. leprae*, using Mouse Foot Pad (MFP) assay and molecular methods. 32 smear positive leprosy patients with features of Relapse / Irregular treatment / New cases were included in the study. Skin biopsy was done and the samples were processed for MFP assay and PCR assays were carried out to amplify 305bp of *rpoB* gene and 388bp of *fol P1* gene. PCR products were further purified and processed for direct sequencing and for non radioactive Single-strand conformation polymorphism (SSCP) analysis. MFP assay showed significant growth in 23 out of 31 samples processed (74%). 8 isolates were dapsone resistant and one isolate showed combined resistance against dapsone, rifampicin and clofazimine. Amplification of *rpoB* and *fol P1* genes was successful in all the 32(100%) samples. Among the *fol P1* products sequenced, 6 isolates showed mutations at 53(or) 55 amino acid positions and these isolates showed high (or) intermediate level resistance to dapsone in MFP assay. Among the *rpoB* products sequenced, mutation was detected in one isolate consistently at 433 amino acid position, which was resistant to rifampicin by MFP assay. However reverse sequencing ruled out any mutation. SSCP analysis showed results consistent with that of direct sequencing. Thus molecular methods are found to have potential scope for rapid detection of mutations against anti-leprosy drugs.

Expression of *mce1A* gene of *Mycobacterium leprae* in *Escherichia Coli* Inhibits Host Cell Growth

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Introduction : Mammalian cell entry protein (Mce1A) helps in the survival as well as efficient entry of mycobacteria into the macrophages. *Mycobacterium leprae* genome has only one functional *mce* cluster, which may be essential for survival and possibly determines the virulence. **Methodology :** PCR amplified *mce1A* from leprosy biopsy was cloned into the expression vector pQE31 and transformed into *E. coli* M15(pREP4). Histidine tag at the N-terminal end allowed purification as well as detection using NiNTA metal affinity column and anti-His antibody respectively. Protein was also identified using mass spectrometry. Overlap extension PCR was done to introduce mutations. **Results :** Using anti-His antibodies, Mce1A was detected as a 50.3 kDa protein. Viable counts showed that cells carrying *mce1A* failed to divide after IPTG induction. To examine the effect of rare codons a truncated protein (deleting 179 amino acids at N-terminal end) was constructed. This protein was overexpressed as inclusion body (27 kDa) and these cells were unaffected after IPTG induction. The cells having a mutated construct, with only one rare codon deleted, were also unaffected after IPTG induction. **Conclusion :** Removal of a rare codon eliminated the cessation of cell division which was due to possible ribosome stalling during translation. For over expression of Mce1A removal of entire rare codons from N-terminal end may be required. **Key words :** Mce1A protein, overexpression, rare codons, mutation, *Mycobacterium leprae*.

Immunogenetic Profile of Leprosy Patients of Karakalpak Nationality

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Karakalpak focus of leprosy was active in Central Asian region where leprosy karakalpaks patients took the first place. The aim of investigation – to study distribution of alleles genes HLA II class among leprosy Karakalpak patients. 40 leprosy karakalpak patients and 76 controls were typed for HLA genes DRB1, DQA1, DQB1 by using PCR-MSSP. The frequencies of alleles HLA-DRB1-15, DQA1-0102, DQB1-0502, DQB1-0602, and of genotypes 15-0102-0602 and 15-0103-0601 were significantly increased in the patients as compared with the control subjects. On the other hand, the occurrence of HLA DRB1-08, DQB1-0401 and of genotype 09-0301-0303 was significantly lesser in the patients. Alleles DRB1-16, DQA1-0401 and genotypes 16-0102-0502 and 15-0102-0602 were met only in leprosy patients, genotype 08-0401-0401 only in healthy persons. Our results suggest that HLA-class II genes confer susceptibility to or protection from leprosy to the Karakalpak. This study along with our earlier studies on HLA association in leprosy suggests that HLADRB1-15 alleles may be universal marker of susceptibility to leprosy. **Key words :** leprosy, susceptibility, alleles, genotypes, karakalpaks.

Immunohistochemical Analysis of Skin & Nerve in MB Leprosy Patients in the INFIR Cohort Study

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Background & Objective: Tissue expression of TNF- α , TGF- β and iNOS in 298 skin biopsies at first diagnosis and 68 nerve biopsies at reaction were studied in the INFIR Cohort. In addition, biopsies were stained with H&E stain, modified Fite Feraco stain, CD68 cell marker and S100 to observe morphological changes in the tissues. The objective of the study was to characterize the cellular infiltrate and identify any association of these cell and cytokine markers with nerve function impairment in leprosy.

Results & Discussion: The cytokines TNF- α , TGF- β and the enzyme iNOS were detected in 79, 94 and 78 percent of skin biopsies respectively. The levels of staining for these molecules were similar across the spectrum. The presence of TNF- α , TGF- β and iNOS were significantly higher in the reactional group and may be involved in nerve damage. The presence of these molecules in non-reactional tissues suggests their involvement in the disease pathology as such. 68 nerve biopsies taken at the time of the event were available for analysis. CD68, TNF- α , TGF- β and iNOS staining were detectable in 88, 38 and 28 percent of the biopsies respectively. S100 staining was higher in group that showed no significant lesion histologically than in indeterminate group. 45% of BT nerves in T1R stained for S100 had a staining pattern reflecting extreme nerve destruction. **Conclusion :** For the first time the association of TNF- α , iNOS and TGF- β with RR has been clearly demonstrated. The three molecules detected in immunohistochemistry showed a significant association with the presence of skin reaction and nerve damage. **Keywords :** Immunohistochemistry, Cytokines, Leprosy, Nerve Function Impairment.

Comparative Tissue TNF- α and Anticeramide Antibody in MB Leprosy Patients in the INFIR Cohort Study

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Introduction: Serum TNF- α protein and anticeramide antibodies were measured in 303 leprosy patients at diagnosis and every month for 12 months in the INFIR cohort. These molecules were tested as potential markers for reversal reaction and nerve function impairment (NFI). **Methodology :** TNF- α and anticeramide antibodies were measured using Sandwich & Indirect ELISA techniques respectively. Serum TNF- α levels were also compared with immunohistochemical presence of TNF- α in skin and nerve biopsy in 147 patients in the cohort. **Results :** There was an association of TNF- α with new sensory and motor Nerve function impairment. Comparative analysis of TNF- α revealed the presence of TNF- α in only one of the tissues i.e., plasma, skin or nerve (35%, 5% and 3% respectively). When concomitant expression of TNF- α in only two tissues was analyzed it was detected in 20% in plasma and skin; 10% in plasma & nerve; and 3% in skin and nerve. TNF- α was absent from all three tissues in 9% of the patients and present in all three tissues in 15% of the patients. **Conclusion :** TNF- α and anticeramide antibodies may be associated with the pathological processes of leprosy and in the acute immunological phase of the disease. The results also showed that TNF- α expression in the plasma, skin and nerve are differentially regulated by the extent of individual tissue inflammatory processes. **Keywords :** TNF- α , Anticeramide antibodies, Leprosy, Neuropathy.

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The Development and Manufacture of Novel Skin Test Antigens for Use as Early *in vivo* Diagnostics for Leprosy

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Current diagnostic methods for leprosy are laborious, lack sensitivity, and require trained clinicians to decipher results. Due to the need for improved early diagnostics, two novel leprosy antigens have already been produced. Presently, these antigens, composed of *M. leprae* soluble antigens (MLSA) and *M. leprae* cell wall-associated protein (MLCwA), are under investigation in a late phase II clinical trial in Nepal. Furthermore, new diagnostic candidates, such as the *M. leprae* membrane antigen (MLMA), have been developed and are ready for production. Development and manufacturing of this material is the responsibility of the PDM Core in collaboration with the NIH Leprosy Contract at Colorado State University. Clinical grade antigen is manufactured under current Good Manufacturing Practices (cGMP), which comply with US Food and Drug Administration (FDA) and International Conference on Harmonization (ICH) guidelines for quality of product permitted in human clinical trials. Recent quality control assay development and process standardization allow for product characterization and improved evaluation of sterility, safety, purity, potency, and identity of the final product. Thus, the PDM Core is poised for initiation of subsequent manufacturing campaigns, which consist of *M. leprae* whole cell purification, cellular subfractionation, and refinement, eliciting the next generation of skin test antigen candidates.

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Genetic Variability in *Mycobacterium leprae* on TTC Repeats by Polyacrylamide Gel Electrophoresis (PAGE) in Nepal

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Strain differentiation of *Mycobacterium leprae* would be of great value for several epidemiological investigations. From the *M. leprae* genome sequence database, TTC DNA repeats were identified. Primer sets designed to amplify the region flanking TTC repeats revealed PCR products of different sizes, indicating that the number of repeats at each locus may be variable among *M. leprae* strains. Upon analysis of the TTC repeat region in each of the *M. leprae* strains by PAGE showed a variation of 3 to 30 repeats. In the *M. leprae* strains of 117 patients, *M. leprae* with 13 and 15 TTC repeats were the most common, and this was followed by strains with 9, 14 and 17 repeats. This study thus indicates that there are variable numbers of TTC repeats in a non-coding region of *M. leprae*, and that the TTC region may be useful for strain differentiation for epidemiological investigations of leprosy. **Key words** : polyacrylamide gel electrophoresis (PAGE) in mycobacteria.

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A Common Polymorphism in TLR1 is Associated with Impaired Signaling in Response to Mycobacteria and Protection from Reversal Reaction in Leprosy

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Introduction : The host factors that regulate leprosy susceptibility are poorly understood. We recently identified a common variant in the transmembrane domain of Toll-like receptor 1 (TLR1), T1805G (I602S) that regulates the immune response to triacylated lipopeptide, a synthetic ligand for TLR1. We investigated whether TLR1-deficiency is associated with susceptibility to leprosy and reversal reaction, an immune reaction characterized by Th1 T cell responses. **Methods** : Allele 1805G was associated with markedly impaired TLR1-mediated NF- κ B signaling in response to stimulation with heat-killed extracts of *M. leprae* and *M. tuberculosis* in transfected HEK293 cells. We genotyped SNP T1805G in a case-control study of 938 Nepalese leprosy patients. **Results** : t1805g was not associated with susceptibility to leprosy type, although GG individuals showed an increased risk of lepromatous vs. tuberculoid leprosy (OR 5.12, 95% CI 0.64-41.17, P=0.087). However, the 1805G allele was associated with protection from reversal reaction (OR 0.51, CI 0.30-0.88, P=0.013). The GG/GT genotypes were also associated with a lower likelihood of reversal reaction when compared to TT individuals (OR 0.55, CI 0.32-0.97, P=0.036). **Conclusion** : Our findings suggest that TLR1-deficiency may impact clinical outcomes such as reaction. **Key words** : TLR1 polymorphism, leprosy.

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Definition of *M. leprae* Native Fractions Towards the Discovery of New Diagnostic Tools

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Native subcellular fractions of *Mycobacterium leprae* have been extensively evaluated with state of the art techniques to define the proteome, identify immunogenic components, decipher surface proteins, and probe for secreted proteins. The sum of this work provides a substantial collection of unique antigens that may be ideal candidates for developing new diagnostic tools for assessing pre-clinical *M. leprae* infection. The purpose of this work is to evaluate the distinctive features of these antigens and/or subcellular fractions and to test them in a comparable diagnostic platform. Methods used to elucidate and define the cytosol, membrane and cell wall of *M. leprae* native fractions consists of extraction, phase separation, chemical manipulation, two-dimensional gel electrophoresis, proteolytic cleavage, mass spectrometry, and comparative genomic and proteomic analysis. The top candidate identified to-date is a membrane fraction exposed to oxidation, reduction, hydrolysis and butanol extraction to remove immunomodulatory lipoglycans. *In vivo* guinea pig testing suggests a highly potent and specific antigen, while *in vitro* testing reveals clarification of the two major membrane proteins, MMP-I (ML 0841) Mr 35 kDa, and MMP-II (ML2038) Mr 22 kDa, bacterioferritin. This candidate is being further evaluated for development as a skin test antigen, while examination of remaining antigens continues. **Key words** : native, protein, diagnostic.

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Extraction of Mycobacterial DNA and RNA From Soil

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Mycobacterium leprae is a chronic pathogen causing leprosy. Very little is known about the transmission of the disease and reservoir for *Mycobacterium leprae*. For effective elimination and control of this disease, better understanding of epidemiology is required. Protocols for rapid detection of this organism from various different samples (clinical as well as environmental) are required. This study was designed to assess suitability of DNA and RNA extraction protocols for mycobacteria from soil, so that it can be used to determine the presence or absence of *Mycobacterium leprae* in the environment. We compared different cell lysis protocols for effective extraction of DNA and removal of PCR inhibitors from the soil samples. The DNA and RNA extraction method was standardised using soil seeded with serial dilutions of non-pathogenic mycobacteria like *M. smegmatis* and *M. phlei* followed by PCR and RT-PCR using primers for 16S rRNA gene specific for general mycobacteria. We found that lysis of cells with bead beating in the presence of ethanol effectively lysed cells releasing DNA as well as RNA. Further, use of Sepharose 4B columns removed humic acid compounds that inhibit PCR reaction. RNA could be selectively extracted using acid phenol: chloroform. Further RNase free DNase treatment gave pure RNA preparation that can be used for RT-PCR work. **Key words** : extraction of mycobacterial DNA, extraction of mycobacterial RNA.

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Molecular Epidemiological Analysis of *M. leprae* Infection and Transmission of Leprosy

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Epidemiology of *M. leprae* infection and consequent prevail of leprosy is one of the most important research subjects in leprology. However, until recently, we could not conduct scientific analysis due to lack of knowledge and technique. In 2000, Shin *et al* reported a genetic diversity of leprosy bacillus named "TTC repeat" which makes it possible to analyze *M. leprae* infection in detail. Since the end of 1990s, we are conducting molecular epidemiological survey at leprosy endemic areas in Indonesia to know the situation of *M. leprae* infection in inhabitant of endemic villages. The methods we are using are comparative analysis of the distribution of *M. leprae* genotypes in skin lesions, living environment and daily life water. **Followings are the results obtained so far** : 1. Considerable numbers of inhabitants are carrying leprosy bacillus on the surface of their nasal cavity. 2. TTC genotypes of *M. leprae* detected in a family are often different. 3. It is not rare that household cases have different genotypes; suggesting they are infected by the different sources. 4. The distribution of TTC genotypes is same in living environment and skin lesion; suggesting that patients are infected with bacilli in the living environment. **Key words** : Molecular epidemiology, genotyping of *M. leprae*, non-human sources.

Study of 18 Referral Multibacillary Relapse Cases in Leprosy Received During the Period 2004 -2007

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Objective and Methods : MDT was introduced in the year 1982 because of the emergence of resistance to DDS monotherapy. To evaluate the impact of MDT it is important to document and study the relapse cases as and when they appear. Eighteen referral multibacillary relapse cases received during 2004-2007 were studied in detail. History, body charting and treatment details were recorded. Slit skin smears and a lesional biopsy was also done in all. The lesional biopsy obtained was divided into 2 parts, one part was fixed and processed for histopathology and the second part was homogenized, bacterial load /gm wt was determined. The homogenate thus obtained was appropriately diluted and inoculated into the hind foot pads of normal S/W mice, where viability and drug sensitivity testing was done. **Findings :** Treatment details: Of the 18 cases, 8 (44 %) were treated MB- MDT for 12 months and 7 (38 %) with MB- MDT till smear negativity (2 – 4 years) and 3 cases had between 5 – 11 years of DDS monotherapy. All the 18 cases had an average BI of > 4+ in the slit skin smear on relapse. The average duration between cessation of treatment and appearance of new lesions (DCTR) was > 10 years in MDT treated cases and ~ 25 years in DDS mono treated cases. In the Mouse Footpad test, in 6 cases that were successfully drug tested, one was resistant to both DDS and RFP and one case was resistant to RFP alone. **Conclusion :** In all the MB - MDT cases relapse was detected 8 -10 years after the release from treatment and all had an average BI of > 4+. Detection of resistance to Rifampicin (0.03 gm %) in 2/6 cases in Mouse footpad test is of concern. **Keywords :** Leprosy, Multibacillary Relapse, Rifampicin resistance, MFP test.

Application of New Serological Test for Leprosy in Vietnam

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Since early detection and rapid medication is important for leprosy control, serodiagnosis is very useful to detect *Mycobacterium leprae* infection. We have established new serodiagnostic test using major membrane protein-II (MMP-II) as antigen for detecting leprosy infection. So, in this study, we conducted serological survey of leprosy patients, their contacts, healthy individuals living in the central part of Vietnam. Although Vietnam attained the WHO's leprosy elimination target of less than 1 per 10,000 population in 1995, the number of newly detected cases in the year 2006 was still 666. We measured anti-MMP-II IgG antibody level and anti-PGL-I IgM antibody level in sera from 224 leprosy patients, their contacts and 211 healthy controls by enzyme linked immuno-sorbent assay (ELISA). The percent positivity by MMP-II ELISA was 85% for multi-bacillary leprosy (MB). For pauci-bacillary leprosy (PB) where cell-mediated immunity predominates, 47.0% showed positive results. Although, the positive rate of PGL-I ELISA were almost similar in both MB and PB to those of MMP-II ELISA. These results suggest that MMP-II antibody detection would facilitate diagnosis of leprosy. **Keywords :** Serodiagnosis, Major Membrane Protein-II, PGL-I.

Evaluation of the ML Flow Test as a Point-of-Care Serology Test

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We evaluated the ML Flow test as an additional, serological, tool for the classification of new leprosy patients in Brazil, Nepal and Nigeria. 2632 leprosy patients were classified using three methods: (1) counting the number of skin lesions, (2) slit skin smear examination, (3) serology using the ML Flow test. In Brazil and Nepal about 1/3 of the patients were MB against 1/5 in Nigeria. Seropositivity was 63% in Nigeria, 51% in Brazil and 36% in Nepal. ML Flow test results and smears were negative in the vast majority of PB patients and in 16% of Brazilian and 38% of Nepali MB patients. Testing all PB patients with the ML Flow test to prevent under-treatment would increase the MB group by 18%, 11% and 46% for Brazil, Nepal and Nigeria. Using the ML Flow test as the sole criterion for classification would result in an increase of 11% and 44% of patients requiring MB treatment in Brazil and Nigeria and a decrease of 4% for Nepal. The ML Flow test could be used to strengthen classification, reduce the risk of under-treatment and minimize the need for slit skin smears.

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Relapse Associated with Resistance in Leprosy Patients : A Prospective Study from 2003 to 2007

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In Brazil MDT was effectively implemented in 1991 and contributed to reduce leprosy prevalence, nevertheless, relapses have occurred and its causes are not commonly investigated: treatment failures, persistence of bacilli or drug resistance. **Objective :** to verify the occurrence of resistance bacilli in leprosy patients who relapsed at least 5 years after treatment (DDS monotherapy, DNDS, MDT). **Patients and methods :** multibacillary patients presented with new lesions, diagnosed clinically, attended by spontaneous demand. A skin biopsy was collected from the lesion for mouse foot-pad inoculation according to Shepard's protocol. A total of 52 patients were evaluated. **Results :** Among relapse cases: 21 (40.3%) were sensitive to dapsone and rifampicin, 06 (11.5%) were resistant to dapsone (02 DDS monotherapy, 04 MDT), 02 (3.8%) resistant to rifampicin (MDT) and 23 (44.2%) were inconclusive; multiple resistance was not verified. **Conclusion :** The finding of resistance samples show the need of follow-up of patients to validate treatment schemes. Surveillance of drug resistance cases using appropriate approaches are needed, especially in endemic countries such as Brazil. **Key-words :** leprosy, relapse, drug resistance, dapsone, rifampicin.

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Recombinant BCG Expressing *Mycobacterium leprae* or *Mycobacterium tuberculosis* Ag85b Induce Protection Against *M. leprae* Challenge Comparable or Superior to BCG

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Background : Renewed interest in improving BCG as a vaccine for tuberculosis and leprosy have produced new vaccine constructs including recombinant BCG (rBCG). rBCG expressing *Mycobacterium tuberculosis* (MT) Ag85B (rBCG30MT) has been shown to provide enhanced protection against MT challenge in guinea pigs compared with parental BCG. **Methodology :** Here, we tested the efficacy of rBCG vaccines expressing either the *Mycobacterium leprae* (ML) or the MT form of Ag85B in the mouse model of leprosy. Methods rBCG30MT carrying plasmid pSMT3 encoding the MT-Ag85B gene and rBCG30ML carrying plasmid pNBV1 encoding the ML Ag85B gene were constructed using BCG Tice. BALB/c mice (n = 15/group) were sham-immunized or immunized with 1x10⁷ viable rBCG30MT, rBCG30ML, or BCG (Tice), or with heat-killed ML. Mice were challenged 2.5 months later in each hind foot pad with 5x10³ viable ML, and 210 days after challenge, the number of ML/foot pad was enumerated. Splenocytes and lymph node cells from vaccinated (n=3) and control (n=3) mice were tested for sensitization to purified protein derivative (PPD) by lymphocyte transformation (LT). **Results :** All vaccinated groups showed sensitization to PPD by LT. Splenocytes from rBCG30ML-immunized mice [stimulation index (SI) = 14.5] and lymph node cells from rBCG30MT-immunized mice (SI = 67) showed the strongest LT responses. All vaccines provided substantial protection in the mouse foot pad assay (P < 0.0006, Mann-Whitney test). In the first experiment, both rBCG30MT and rBCG30ML gave protection superior to BCG and the difference between rBCG30MT and BCG was statistically significant (P = 0.04) as was the difference between the two rBCG30 groups combined and BCG (P = 0.04). In the second experiment, all BCG strains gave protection at the limit of detection. **Conclusions :** Both rBCG30 strains protect against leprosy in the mouse model, and in the one experiment in which an efficacy comparison was feasible, the efficacy of rBCG30MT was significantly greater than BCG. These data suggest that rBCG30MT may offer cross-protection against leprosy in humans that is comparable or superior to BCG.

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The Leprosy Trend in Brazil : Limited Detection Rate

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Objective : To analyze the magnitude of leprosy in Brazil by the speed of the fall in the detection rate, in view of operational changes occurring between 1987 and 2006. **Material and Methods :** Ecological study of the secular trend of new leprosy cases diagnosed in Brazil from 1987 to 2006. A linear trend was used to analyze the detection rate in two different moments of endemic manifestation. The cut-off point was the year with the greatest detection rate coefficient: 1997. To analyze the potential increase in accessibility to diagnosis and treatment, we used a comparison of the proportion of cases diagnosed with the health services and municipalities, over four five-year periods over one twenty-year period, within the time span of the study. **Results :** The leprosy detection rate in Brazil from 1987 to 1996 has a positive slope coefficient ($\hat{\alpha}=0,165$), characterizing an average increase estimated at 11.7 % per year. From 1997 to 2006 a negative slope coefficient ($\hat{\alpha}= - 0.075$), was verified. The number of health services increase continuously during every period described by more than 100%. The number of municipalities presented an important increase during the third period, from 1997 to 2001, with 100% growth compared to the period five years before. **Conclusion :** Brazil seems to have passed through the transition period to its target of a constant decline in the detection rate. The increase in diagnostic capability shows that the country is on its way to eliminating leprosy as public health problem. **Keywords :** leprosy, trend, Brazil. Andrade, Ignotti.

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AIDS in Leprosy Cases, Leprosy in AIDS Cases, Low Prevalence in Brazil

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Objective : The occurrence of leprosy-HIV co-infection is becoming more and more frequent throughout the world, with an epidemiological profile that may not follow the same path as TB/HIV where these diseases are still a public health problem, as is the case in Brazil. Although the frequency of TB/HIV co-infection has been well studied in Brazil, for leprosy/HIV there is a need to further explore the topic. The main aim of this study is to show the number of leprosy/HIV cases co-infection registered in the official Brazilian Information Systems (Sinan). **Material and Methods :** Probabilistic linkage was carried out based on similar variables available in the databases (e.g. name, sex, date of birth, place of residence) from the HIV/leprosy co-infection database with individual data from a leprosy database in Brazil. **Results :** This study shows less than 1% similar records. The low level of concordance of leprosy patients identified in the HIV/AIDS database examined in the study can be explained in several ways. First, mistakes might have happened in the linkage process. Some pairs could have been erroneously classified as true matches (false matches), whereas some true matches could have been missed (false non-matches). Second, the low number of pairs observed can also be explained by a non-recording of other pathologies (i.e. failure to record). Showing the potential advantages and disadvantages of the use of the probabilistic record linkage methodology would require a field validation of reported cases to confirm the low prevalence of leprosy/HIV co-infection (regardless of which disease occurred first). **Keywords :** Information Systems; Data Comparability; Acquired Immunodeficiency Syndrome; Epidemiology, leprosy; leprosy/HIV co-infection.

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Background : Leprosy is caused by *M. leprae* and still endemic in many countries. Current figures indicate that 0.6 millions cases occur annually and about 75% cases come from India and Brazil. Worldwide 2 million people have disabled by the consequence of leprosy. Though disease is aimed to be eradicated from world scenario but endemic pockets present a challenge to public health in low resource settings, where not only the treatment but many other things would be needed to control the diseases. This study using data from Agra Leprosy Project (ALP) reveals important facts that must count on public health decision making. **Methods :** This study uses data from projects from field and OPD. ALP examined 361321 persons from randomly selected 300 villages, 11 towns and 6 areas of city. 42272 persons resurveyed for incidence estimation of disease. Using logistic models hints on determinants of disease and disability prevalence, estimates relapses from long term follow up after variable drug regimens and also indicate on defaults and its causes. **Results :** The Prevalence (PR) of leprosy was found to 16.4/10,000 in ALP; high in towns than in rural or city. Analysis suggests that factors like clean living, sufficient sun exposure, Pucca house-type, healthy environment at work reduces the risk of leprosy significantly. Incidence study suggest that normal persons (No case in family) has incidence of 4.6/10K PY, in comparison to 41 in paucibacillary and 131 in multibacillary Contacts ($p < .0001$). Visible paralytic disability was 7.9%; 3.8% in PB and 16.9% in MB patients. Disability was significantly increased with increased nerve thickening and delay in starting treatment among neuritic patients and no. of thicken nerves in patients with anesthetic skin lesions. Relapses occur more ($p < .05$) in MB patients given fix duration therapy than among those given therapy till smear negativity. About 20% defaulted from treatment in a cohort of PB patients and main cause of default has been intolerance to leprosy drugs. **Conclusion :** There are many things to learn from leprosy epidemiology; being a slow mycobacterium disease. Hurried efforts may result in failure and affected world may face emerging threats in future. Improved socioeconomic status, increased awareness and better drug regimens would ultimately help to eradicate this disease from the Globe. Detail results would be presented.

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Mycobacterium leprae has low pathogenicity and leprosy affected persons do not feel sick till the disease is well established. More over, skin lesions due to leprosy do not hurt the affected person. The social environment, the so called stigma also inhibits self reporting by the affected person. All this leads to late reporting of leprosy affected person for treatment and by the time they report for treatment, disabilities and deformities already start developing. In urban areas especially big cities because nearly 40 % of the population in these cities is migratory and health behavior of urban dwellers is obscure and this affects the effective control of the disease in urban areas. Interview of leprosy affected persons was conducted. This paper deals with the health seeking behaviour of leprosy affected persons, reporting or referred to hospitals in Delhi so as to help policy makers and programme managers to develop strategies for urban areas for control of the disease and prevent development of the disability in leprosy affected persons.

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The aim of the present study was to determine the predictive factors which contributed to change in the WHO disability grade of leprosy patients attended by the physiotherapists of Barreiro Health Center /Belo Horizonte-MG, from 1993 to 2003. The retrospective cohort involved 595 patients. **Methodology :** A descriptive analysis of the sample was made. Later a univariate analysis, and a multivariate analysis, through the ordinal logistic regression model, to verify the predictive factors of disability at diagnosis. Finally the disability grade at diagnosis and release from treatment were compared using the marginal homogeneity test, followed by a univariate analysis, and a multivariate analysis using the CHAID tree. **Results :** Gender, age and number of nerves involved were predictive factors for the disability grade at diagnosis. A positive dynamics was verified regarding change in disability grade, when comparing diagnosis to release from treatment. The disability grade at diagnosis is the main factors that predict the evolution of the disability. The present study showed the need for early diagnosis of neuropathy as well as an efficient association of pharmacological and non-pharmacological treatment.

The Use of Geographical Information Systems (GIS) to Improve Active Leprosy Case Finding Campaigns in the Municipality of Mossoró, Rio Grande do Norte State, Brazil

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Introduction : This study was undertaken using geographical information systems (GIS) with the objective of defining low-cost, effective strategies to control leprosy. **Methodology :** Methodological tools used: Mossoró's land registry plan, Ikonos PSM satellite image, SINAN database (National Morbidity Notification Information System - data from 1998 to 2002), online postal codes, notification forms and registration books from the municipal health administration. **Results :** Between 1998 and 2002, 368 leprosy cases were diagnosed in Mossoró, from which 281 were geo-referenced. A density map was produced showing the highest concentrations of leprosy and areas with greatest risk of transmission. Four areas with leprosy greatest agglomeration were identified and active case detection campaigns organised. During those campaigns, 104 new leprosy cases were confirmed, increasing detection rate from 5.16/10000 inhabitants in 2004 to 9.34/10000 in 2005. 29 patients had a disability, with 17 with grade II disability. **Conclusions :** Even with continuous training of public health sector professionals, diagnosis continues to be late, demonstrating the need for targeted campaigns. **Key Words :** Leprosy, epidemiology, GIS, geo-referencing, ArcView, spatial analysis.

Hyper-Endemic Foci of Leprosy in Venezuela : Environmental Influence or a More Transmissible Strain of *M. leprae*?

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In Venezuela, during the last years, the prevalence of leprosy has remained relatively stable, at about 0.6 cases per 10.000 since 1997, being the detection of new cases about 500 per year. Nevertheless, epidemiological studies carried out in three states of central Venezuela where Leprosy has not been eliminated as a public health problem, reveal communities with a hyperendemic situation. We have detected communities with 40 to 5600 inhabitants where prevalence rates varied from 18.7 to 1294.3 per 10.000 with a new case detection rate up to 211.4/10.000 in a two year period. Furthermore, examination carried out in successive years have continued to reveal new cases in these hyperendemic areas, even though MDT was initiated immediately after diagnosis, revealing that MDT of newly diagnosed cases has not modified the pattern of transmission of the disease in these foci.

Observations demonstrate also that over 80% of the cases in these areas are paucibacillary and that bacilli found in these patients also show different morphological and staining characteristics than those from non hyperendemic zones, exhibiting small bacterial populations of solid bacilli without significant degeneration. Preliminary results of a genetic survey performed in order to establish the SNP (single nucleotide polymorphism) type of pathogens among distinct geographical areas of the country, have shown that there is a difference in the distribution of SNP-type between endemic and hyperendemic regions, being SNP-type 4 in hyperendemic areas twice as frequent as in the non-hyperendemic regions.

Trends in Prevalence of Leprosy in South India Leprosy Vaccine Trial, 1991-2002

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Introduction : A multi-arm leprosy vaccine trial was conducted in Tamil Nadu (TN), South India during 1991-2002. We described leprosy prevalence in the trial area and compared with prevalence reported by TN leprosy control programme. **Methodology :** We defined three cohorts from the trial area (1) vaccinated with any of four candidate vaccines (n=132,703) (2) placebo (n=38,697) and (3) unvaccinated (n=45,233). We calculated age and sex standardized prevalence for three follow-up surveys (1994, 1997 and 2001). **Results :** Overall crude prevalence at baseline (1991) was 254 per 10,000. Standardized prevalence (per 10,000) at the first (1994), second (1997) and third (2001) follow-up were: vaccinated: 44, 35 and 17; placebo: 44, 61 and 43; unvaccinated: 61, 62 and 34, respectively. Comparatively, prevalence per 10,000 for TN were 9 (1994), 8 (1997) and 4 (2001). Overall prevalence was higher for those aged above 55 years (86, 67 and 48) as compared to those aged 1-19 years (34, 37 and 17) and for men (52, 51 and 29) compared to women (42, 43 and 26) for the three surveys respectively. **Conclusions :** Prevalence showed moderate decline in both the trial area and in TN. Prevalence reflects cumulative effect and thus is not a sensitive indicator for assessing trends. **Keywords :** Leprosy vaccine trial, South India, prevalence trends.

Declining Trends in Incidence of Leprosy in South India Leprosy Vaccine Trial, 1991-2002

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Introduction: A multi-arm leprosy vaccine trial was conducted in Tamil Nadu (TN), South India during 1991-2002. We described leprosy incidence in the trial area and compared with new case detection rates (NCDR) reported by TN leprosy control programme.

Methodology: We defined three cohorts from the trial area (1) vaccinated with any of four candidate vaccines (n=132,703) (2) placebo (n=38,697) and (3) unvaccinated (n=45,233). We calculated age and sex standardized incidence for three follow-up surveys (1995, 1998 and 2002). **Results:** Standardized incidence (per 10,000 person-years) at the end of first (1995), second (1998) and third (2002) follow-up were: vaccinated: 24, 7 and 3; placebo: 24, 13 and 10; unvaccinated: 36, 13 and 7, respectively. Comparatively, NCDR per 10,000 for TN were 12 (1995), 7 (1998) and 5 (2002). Overall incidence was higher for those aged above 55 years (48, 13 and 8) as compared to those aged 1-19 years (19, 8 and 4) and for men (29, 10 and 6) compared to women (23, 9 and 5) for the three surveys respectively. **Conclusions:** Use of efficacious vaccines explained the drop in incidence in the vaccinated population. Drop in incidence rates in the placebo and unvaccinated population suggests indirect effect of vaccines and possibly multi-drug therapy. **Keywords:** Leprosy vaccine trial, South India, incidence trends.

Characteristics of New Leprosy Cases Detected Before and After Elimination Era in Shandong Province, P. R. China

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Objective: To describe the characteristics of newly detected cases of leprosy before and after elimination era, in particular relating to the disability. **Methods:** Data of the newly diagnosed leprosy patients from 1983 to 2006 were abstracted from the national database of leprosy and crosschecked with the individual records. The characteristics of the patients diagnosed in the period of 1983-1994 were compared with those diagnosed in the period of 1995-2006. **Results:** Skin clinic was the main detection means in the two periods. On average the delay in diagnosis has a mean value of 51.2 months in the period of 1983-1994 compared to a mean value of 34.3 months in the period of 1995-2006. The proportion of new cases with WHO grade-2 disability was 24.2% in the period of 1983-1994 and slightly increased to 26.8% in the period of 1994-2006. The risk factors related to the disability at diagnosis were analyzed and compared between the two periods. **Conclusions:** Under the low endemic situation of leprosy, identifying the few incident new cases at earlier stage of the disease remains one of the priorities in leprosy control program in Shandong. **Key words:** Leprosy; new case detection; disability.

Change of Disability Status over A Period of Time

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Introduction: LEPRA Society started the leprosy project in Malkanagiri in 1992. POD and POWD services have been extended to all the cases as per the requirement. This paper presents the changes in disability status (both improvement and worsening) after appropriate interventions among the disability cases. **Methodology:** Since inception till December, 2005 the project has registered 3,771 cases for treatment of leprosy. All have been cured with MDT. Among them 674 (17.9%) cases were found to have disabilities; 310 (46%) Gr. I, 364 (54%) Gr. II at the time of registration. All were under chemo & physiotherapy depending upon the duration of onset of disability & clinical condition. **Results:** Among 674 disability cases, 49 (7.3%) improved, 17 (2.5%) worsened and the others remained static. The status of 18 was improved by RFT while the rest 31 took more time. 20 (40.8%) cases received steroids while the other 29 (59.2%) improved without steroids.

Initial Disability status	Subsequent disability status			Total
	Gr-2	Gr-1	No disability	
Gr-2	0	3	3	6
Gr-1	17	0	43	60
Total	17	3	46	66

8 (47%) cases worsened by RFT while the rest 9 (53%) progressively worsened. 8 cases developed motor paralysis and other 9 developed ulcers. **Conclusions:** The progression of disability in 674 cases of leprosy registered during 1992-2005 is noted and presented. **Key words:** Disability grade, Impairment, Paralysis.

Assessment of Knowledge and Skills in Early Diagnosis of Leprosy Among Skin Doctors in Shandong Province, P. R. China

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Objective : To assess the knowledge and skills in early diagnosis of leprosy among skin doctors in Shandong Province. **Methods:** Skin doctors at prefecture and county levels around the province were invited to participate in a one-day training workshop on leprosy. As a pretest the knowledge and skills on early diagnosis of leprosy were assessed with a questionnaire, which included personal information of the participants, infectiousness, transmission, early signs/symptom of leprosy, attitude towards leprosy, and referral knowledge. The results of the pretest were compared with a posttest. **Results :** Of the 184 participants assessed 52 (28.3%) had the experience on leprosy patients. Thirty-six (19.6%) doctors had participated a previous training workshop on leprosy. Fifty-eight (31.5%) doctors had basic knowledge on early diagnosis of leprosy. All aspects on early diagnosis of leprosy and referral knowledge had been improved after the workshop. **Conclusions:** More efforts should be made to train skin doctors in order to find out the few incident leprosy cases timely under a low endemic situation of leprosy in Shandong province. **Key words :** Leprosy; early case detection; training.

Long-Term Effects of Chemoprophylaxis

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The population of five Indonesian islands was actively screened for leprosy before the intervention in 2000 and subsequently once yearly for 6 years. No chemoprophylaxis was given on one 'control' island. Chemoprophylaxis, consisting of two doses of rifampicin, was given to household and neighbour contacts of leprosy patients on one island ('contact') and to all eligible persons on three smaller islands ('blanket'). After 3 years the cumulative incidence was significantly lower in the blanket compared with the control group; there was no difference between the contact and the control groups. Blanket treatment was 75% effective; the number needed to treat (NNT) was 127. After 6 years the difference in cumulative incidence between the blanket and control groups was not statistically significant anymore. Effectiveness of blanket treatment was reduced to 57%; the NNT was 244. When leaving out the PBI patients the effect was still significant. The relative risk of developing leprosy was lower among persons who took at least one supervised dose of rifampicin. In this high endemic area for leprosy, population-based chemoprophylaxis was associated with a reduced leprosy incidence in the first 3 years, but this reduction was not significant anymore after 6 years.

A 28 Year Cohort Study of Children Born to Mothers with Leprosy [1975-2003] : Are the Children at Risk ?

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Purpose was to evaluate development of leprosy in children born to leprosy mothers. 120 children from leprosy and 36 from non-leprosy mothers were assessed at intervals, clinically from birth, and with nerve function tests from puberty, to age 26-28 years (A9 children). A second cohort of age-matched children, living in the same area was studied from 1991 (A9C exposed controls). A third age-matched cohort from an area of very low leprosy endemicity was studied in 2002/4 (A9UC) unexposed controls. At puberty, 15/99 A9 children had very early leprosy. Two years later 13/15 of these showed new nerve damage despite MDT. 40% of the cohort with easily palpable/slightly enlarged nerves (grade ≥ 3) with healthy skin showed early neurodysfunction. Detailed neurological studies were initiated, including tests of small nerve fibre function. Results from A9, A9C and A9UC, respectively, showed leprosy: 21%, 0%, and 0%; nerves: ≥ 3 : 47%, 25% and 3%; nerve function impairment: 98%, 73% and 7%. These findings are indicative of a significant level of as yet undiagnosed leprosy among teenagers and young adults in villages where leprosy was highly endemic. **Keywords :** leprosy, children, nerve size, nerve function impairment, Ethiopia.

Future Prevalence of WHO Grade 2 Impairment in Relation to Incidence Trends In Leprosy : An Exploration

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Introduction : This study explored the relationship between leprosy incidence trends and the future prevalence of WHO grade 2 impairment. **Methods :** Three scenarios were defined to estimate incidences and prevalences of impairment beyond 2000, assuming 6%, 12% and 18% annual declines in case detection rate respectively and 6% impairment among new patients. Data from 1985-2000 were used for projecting leprosy incidences up to 2020. To estimate future grade 2 prevalences, the survival of existing and new impaired individuals was calculated. **Results :** The 6% scenario predicts 410,000 and 250,000 new patients in 2010 and 2020 respectively. The grade 2 prevalence in these years will be 1.3 million and 1.1 million respectively. The 12% scenario predicts 210,000 new patients in 2010 and 70,000 in 2020. The grade 2 prevalences will be 1.2 million and 0.9 million respectively. In the 18% scenario, the incidence will be 110,000 in 2010 and 20,000 in 2020, and grade 2 prevalences will be 1.1 million and 0.8 million respectively. **Conclusions :** The grade 2 prevalence decreases much slower than leprosy incidence and case detection in these scenarios. This implies that a substantial number of people will live with impairment and need support in the next decades. **Keywords :** leprosy, WHO grade 2 impairment, prevalence, future trends.

A Causal Model of Factors Related to Time Before Treatment Seeking Among Leprosy Patients at Buri Ram Province Thailand

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This study aimed to determine the factors related to time before treatment seeking among leprosy patients using path analysis based on psychosocial model ; Health Belief Model. Samples of the study were 87 leprosy patients who received treatment from general hospital and community hospitals located at Buri-Ram province. The data were collected by structured interview during April 2-30, 2004. Then, descriptive statistic and path analysis were used to analyze the data. The results revealed that majority of samples were male (54%), time before treatment seeking 0-12 month (56.3%), and without disability (77 %). Moreover, mean score (after adjusting to 0-100) of perceived threat of leprosy was found to be the highest (= 87.26) According to path analysis, the results are as followed : the variables which had direct effect to time before treatment were perceived threat, and perceived benefits minus barrier to disease prevention. While, the perceived threat had positive effect directly to time before treatment (b = 0.233), perceived benefits minus barriers to disease prevention had negative direct effect (b = -0.192). The household income had positive direct effect to perceived benefits-perceived barriers of disease preventive (b = 0.035). Regarding the perceived threat, the variables which had effect to it were cues to action, perceived susceptibility & perceived seriousness and household income. The cues to action and the perceived susceptibility and perceived seriousness had positive direct effect to perceived threat (b = 0.089, 0.291 respectively). At the same time, the household income had negative direct effect to perceived threat (b = -0.074) and positive direct effect to perceived susceptibility & seriousness (b = 0.124). In addition, it had indirect effect to perceived threat via perceived susceptibility and perceived seriousness. Of all causal relationships of the path, the only relationship which had statistically significant was perceived susceptibility and perceived seriousness to perceived threat (P< 0.05). The results of this study will be useful for the policymakers to plan leprosy control, prevention strategies, health education, and health media production emphasizing on leprosy patients' perception of susceptibility and seriousness, perceived benefits, perceived barriers of disease preventive in order them to seek treatment earlier before disability occur.

Absence of Late Relapse in a Cohort of Patients with Multibacillary Leprosy

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Introduction : Relapse in multibacillary leprosy has been widely debated. The risk of relapse is greatest in those who start treatment with a high bacillary load, and that the occurrence is greatest ten years or more after completing treatment. Early relapses, in the first five years after treatment completion, must be distinguished from reactions, but probably reflect inadequate treatment. Up to now, it has not been possible to determine the underlying mechanisms of late relapse – whether it is the recrudescence of an infection that was never completely cleared, or re-infection from an external source. **Patients and Methods:** A sub-group of 141 patients, all with an initial average Bacteriological index (BI) of 3 or more, was identified from the original AMFES cohort of 660 patients in central Ethiopia. This sub-group was followed for between 10 and 15 years from completion of treatment (24 months MDT). **Results and Conclusions :** No cases of relapse were identified in this group of patients. The implications are discussed. **Key words :** leprosy, relapse.

Detection of *M. leprae* in Soil and Other Environmental Sources so as to Determine Sources of Transmission and Spread of Leprosy

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In many countries still the incidence of leprosy is major concern in spite of successful implementation of multi drug therapy. There are speculations about sub-clinical infection and extra-human reservoir for *Mycobacterium leprae*. Possibility of presence of *M. leprae* in the environment has not been conclusively proved or disproved. Some reports suggest that *M. leprae* can survive in soil under experimental conditions. The potential of soil or water or environment to act as a reservoir for *M. leprae* has not been sufficiently explored as yet. Though these extra human sources may or may not facilitate the growth of *M. leprae* they could act as a potential reservoir. In the present study, we tested for different protocols to extract DNA from soil samples for which soil seeded with *Mycobacterium smegmatis* and *Mycobacterium phlei* was used. Subsequently, 50 soil samples were collected from different locations from a leprosy resettlement village. DNA was extracted from these samples and amplified using *M. leprae* specific primers to target the *pra* gene and 16s rRNA gene. It was found that out of 50 soil samples 9 samples gave positive results with *M. leprae* specific primers suggesting that there is likelihood of *M. leprae* contamination in the environment.

Steering National Leprosy Eradication Programme

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Many achievements have been credited to national Leprosy Eradication Program in India. This all is due to strong political commitments, available infrastructure, funds and other resources. Long association of national & international NGOs and partnership with ILEP agencies, WHO, Nippon foundation, Novartis has further strengthened the program. Basic services are integrated into general health care system. NLEP is still centrally sponsored program. Referral services are being strengthened by involving PMR departments of medical colleges. Opportunities of Village health & sanitation committee and Rogi Kalyan Samiti, under NRHM are being utilized. Quality of services is monitored by treatment completion rates and patient's perspectives. New case detection rate is the main epidemiological indicator. Inter & intra departmental coordination and inter-ministerial links and periodic review meetings with state program officers helped in solving the problems. Decentralized district plans, flexi funds and logical approach will further help in steering the program in right direction.

Activity Status Amongst Registered Leprosy Cases in Nepal

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Under treatment cases, numbering 1260, were examined by dermatologists and WHO consultant to assess the activity status of the disease. A check list of signs and symptoms suggestive of the disease being active was prepared and were grouped into three groups. 1. History. 2. Findings in skin, 3. Findings in nerves. Presence or absence of these signs and symptoms were carefully elicited, recorded and analyzed. It was observed that in only 27 % of the cases registered sign and symptoms suggestive of active disease were found. This proportion of active cases did not vary significantly between male (26.1%) and female (28.6%) patients and also among different age groups (Children 26.7%, Adults 27.8% and old 23 %). However proportion of cases active varied significantly between different districts. It showed a range from 6.3 % (Rupandehi) to 61 % (Morang). Similarly the proportion did vary significantly between MB (32%) and PB (20 %) cases. ($P < 0.05$). Appearance of new patches found in 6.5 % (80 out of 1216 patients) of the cases was the most common symptom suggestive of active disease, elicited through history taking. History of reactions found in 3.8 % of (47/1227) patients was the second most common symptom suggestive of disease activity. In 1052 or 86 % of the cases there was no history suggestive of active disease. Erythematous skin patches was the most common finding observed indicative of active disease and was found in 10 % (130) of the cases. Second most common finding suggestive of activity status was infiltration and was seen in 68 (5. %) cases only. 1028 or 83.7% of the cases did not show any signs of activity in the skin barring patches. Tender nerve indicating that disease is active was observed in 88 or 7.2 % of the cases examined. New nerve involvement was found in 1.6 % only. Where as there was no positive signs in nerves indicating that disease is active in 1098 (90.8 %) of the cases. Three fourth of the cases registered were inactive in Nepal. Treatment apart there are other factors that are resulting in such a high percentage of inactive cases being on the register. Factors contributing to this will be enumerated and discussed.

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Data collected from interviewing, examining and perusal of records of 1260 leprosy patients registered for treatment in 8 districts of Nepal, was analyzed and the socio epidemiological factors found amongst them are being presented and discussed. Patients were from 839 different villages. Of these villages 131 had more than one case registered. In 5 villages / towns the number of cases registered was more than ten. Children constituted 10.5 % and those aged 60 years or more accounted for 9.4 % of the registered cases. Slightly over one third i.e. 37.7 % were female patients. Half of our patients were illiterate and 81 % had never attended any school. Illiteracy rate was significantly higher (64.6%) among female leprosy patients when compared to male patients (41.2 %). Average family size was 7.2 with the mode and median being 6 and 7 respectively. Average duration of the disease before diagnosis was 16.8 months (SD 15.4). Median and mode was 12 months. 75th percentile was 24 months. The distance our patients need to travel to access MDT was 3 KMs on an average with 1 KM being the mode. Leprosy patient spends around NRs 16 on travel while seeking treatment. Every patients had stated that treatment is provided free of cost. Fifty three percent of the cases were reporting voluntarily for diagnosis and treatment. Percentage of voluntary mode of detection varied from as low as 38.6 % (Sarlahi) to as high as 80.4 % (Morang) in the eight districts studied. Percentage of cases detected through Contact examination was only 1.5 % with the range in different districts varying from 0 to 2.8 %. However on enquiry 32.4 % of the UT patients had confirmed the presence of another leprosy patient within the family. Positive family history was forthcoming in 36.8 % of the female patients when compared to male patients (29.7 %). The difference observed was statistically significant. (p=0.016) Each and every registered patient without any exception was living with their family and in their own community and village. Leprosy patients in Nepal are poorer, less well educated, come from relatively bigger families. Duration of the disease before diagnosis is considerable and NLEP has to initiate remedial steps. Very low yield of contact examinations coupled with the positive family history in 32 % of the registered cases calls for a thorough review of prevailing practice of contact examinations.

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Introduction : Leprosy prevalence in Ethiopia is 0.9/10,000 but new cases and disability rate seem static. With stigmatization, patients stay long before seeking medical care. Delay worsens disability. ALERT as leprosy referral center, serves patients all over the country. Therefore, patient profile at ALERT represents leprosy in Ethiopia. Rationale behind study was to observe the prevalence of disability among new cases diagnosed at ALERT hospital. **Objectives :** To measure the degree of disability in the new cases. **Method :** Retrospective study of new leprosy cases diagnosed between November 2005 and November 2006. **Results :** New cases observed were 332 within the study period. Age range was 8 to 95 years. Mean age was 34.3 with standard deviation +/-15.8. Categorizing age, 10.5% (35/332) were below 15 years while 89.5% (297/332) were above 15 years. For gender, 70.1% (232/331) were males and 29.9% (99/331) females. A total of 63% with disability according WHO scoring was observed [0 was 37.0% (120/324), 1 was 36.1% (117/324), and 2 was 26.9% (87/324)]. Out of disability score of 2, 13.8% (12/87) were aged below 15 while 86.2% (75/87) were above 15 years; 73.6% were males and 26.4% were females. This means 34.3% (12/35) children are having WHO disability of 2. **Discussion :** General, disability of 63% WHO (1+2) is very high. The 34.3% grade 2 disability in below 15 years group is too high. Percentage of males with grade 2 disability is more than females; 27.6% compared to 22.3% however compared to ratio entering study, the difference is reasonable. **Conclusion :** The findings of this study calls for further investigation and intervention. Disability in new cases is still a problem in Ethiopia.

Comparison of Three Interventions Among Household Contacts of Leprosy Patients with a Microsimulation Model

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Introduction : Although the prevalence of leprosy has dropped dramatically in the last decades, the number of newly detected cases is still substantial. Undetected and sub-clinical cases transmit *M. leprae* before detection, thus maintaining the transmission cycle. Household and other close contacts are a risk group, and interventions targeted at them could have a substantial effect on the incidence of infection. In the absence of a suitable vaccine, several other strategies to break the transmission cycle can be adopted. Preventive treatment with rifampicin has shown to be effective in decreasing incidence among contacts and in some countries household contacts are revaccinated with BCG. Currently, T-cell based tests are being developed to identify sub-clinical infection with *M. leprae*. **Methods :** We developed a microsimulation-model for leprosy in a household-structured population. We calibrated the model on data from the COLEP chemoprophylaxis-trial. We compared the predicted number of avoided cases after introduction of chemoprophylaxis, BCG revaccination and early detection of sub-clinical infection. **Results:** We will present the most recent results of our analyses and comment on the effectiveness of these interventions. We believe that these predictions will have an important contribution to the debate of which interventions should be advocated. **Keywords:** simulation, prediction of incidence, household, intervention.

Analysis on Causes of Death Among Active Leprosy Patients in China

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Summary : Background Analysis on causes of death among active leprosy patients could help us in understanding the disease and improving the quality of services. **Objectives :** To analyse the causes and characteristics of death among active leprosy patients. **Methods :** A retrospective survey was carried out in 24 provinces in China at the beginning of 2006. The special form for collecting information of died leprosy patients was designed. Information about patients with leprosy who died before clinical cure between 1 January 2000 and 31 December 2005 were collected by professional workers at country level. All forms were carefully checked up for reliability and then input the computer for analysis using soft ware SPSS version 10.0 at the national center. **Results :** A total of 524 deaths were analysed. The top leading cause of death was suicide. About 86 patients (16.4%) died with a mean interval of 20.8 ± 19.1 months from starting MDT to death. The second and third leading cause of death was cardiovascular diseases and organ failure to old age, respectively. About 221 patients (42.2%) died within one year after starting MDT. The second month of MDT was the risky month for new patients on treatment. About 20% of patients with liver function impairment, 33.4% of patients with DDS allergy and 27.3% of patients with renal function impairment died during this period, respectively. Among 143 deaths related to leprosy, 37 deaths (25.9%) occurred within 3 months of MDT. **Conclusions:** Five causes of suicide, liver function failure, renal function failure, DDS allergy and leprosy reaction increased the risk of the life of patients during leprosy control activities. Strengthening relationship between the health workers and the patient is very important during the first year of MDT to avoid unnecessary severe events.

The Spatial Distribution of Leprosy in a District in Northwest Bangladesh

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Introduction : Leprosy has an uneven spatial distribution indicating heterogeneity in underlying risk factors or detection intensity. A study of the spatial and temporal distribution of new case detection can help to understand these epidemiological patterns. **Methods :** A retrospective study is conducted in which the spatial distribution of leprosy in a high endemic district in Bangladesh is determined. We traced back the houses of 11,060 patients detected between 1989 and 2003. The space-time permutation test was used to identify high incidence clusters of leprosy. The risk of proximity to towns, leprosy clinics, water, and roads was estimated. **Results:** Several high new case detection clusters were identified. Six clusters were found for a higher rate of voluntary reporting, and other clusters were found for population and contact surveys. There was no difference in age, proximity to geographic objects or fraction of multibacillary leprosy for cases within or outside the clusters. The proximity to towns was associated with the occurrence of leprosy. **Conclusions :** Active and passive case finding found leprosy cases distributed non-uniformly over the district and in time. Cases tended to occur closer to towns, which suggests that, in predominantly rural areas, leprosy is a disease of towns. **Key words:** spatial distribution, Bangladesh, geography, voluntary reporting, active case finding.

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The study assessed the effectiveness of BCG vaccination against leprosy among the contacts of 1161 leprosy patients at the FIOCRUZ Leprosy Outpatient Clinic from June 1987 - December 2006. Following National Leprosy Program guidelines, the Clinic has administered 1 - 2 doses to all healthy contacts since 1991. Among the 5680 contacts, 304 (5.4%) were co-prevalent while 3536 of the 5376 eligible healthy contacts were vaccinated, 30 of whom were excluded due to previous/current tuberculosis or HIV. In 18 years of follow-up, 122 (2.15%) incident cases were diagnosed (58 vaccinated and 64 not), 28 occurring in year 1 of follow up (21 vaccinated - 16 with no scar). The protection conferred by BCG was 56% and was not substantially affected by previous BCG vaccination (50% with a scar and 59% without). The risk of tuberculoid (BT+TT) leprosy during the initial months was high among the vaccinated with no scar. However, it had substantially declined by the first year and the following years, when the protection rate in this group reached 80%. Since Brazil is endemic for leprosy and the detection rate is not declining satisfactorily, vaccinating all contacts could be an effective means of substantially reducing leprosy. Keywords: BCG, leprosy, vaccine effectiveness, contact tracing, Brazil.

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Leprosy NGOs have always felt it is difficult to raise funds. Is leprosy an expensive disease to treat ? To answer this question we calculated approximately (I) Cost of clinical services offered including hospitalization in respect of each patient attending Referral Centre of Bombay Leprosy Project and (II) Cost of offering only physical care to disabled patients at the doorstep in an adopted rural population near Bombay. Only the cost of (A) actual services initially offered to patients and (B) incentives to volunteers supervisors and planners were considered for calculation. Maintenance and administration expenses including cost of surgery, rehabilitation and research were excluded. **Observations :** No. of patients under I and II-534 (recruited so far) Service cost (A) Rs 53,782.00, Delivery cost (B) Rs 2,91,715.00, Average cost of service delivery Rs 647.00 (US \$ 16.00) Ratio of cost of services to cost of delivery of services....1: 5. **Conclusion :** The cost of delivery of service is much higher than the service itself. If any NGO aims exclusively at running referral centers and offering domiciliary care to disabled patients leprosy service is inexpensive. If however, the objective of an NGO is research, rehabilitation, surgery, social work and health education activities etc, cost will mount to high levels.

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It has been speculated that HIV and *M. leprae* co-infection may exacerbate the pathogenesis of leprosy lesions and/or lead to increased susceptibility to leprosy, as seen with tuberculosis. However, so far, HIV infection does not appear to increase susceptibility to leprosy. In contrast, initiation of anti-retroviral treatment (ART) has been reported to be associated with anecdotal activation of *M. leprae* infection and exacerbation of existing leprosy lesions. In order to determine whether ART is associated with worsening of the manifestations of leprosy, a cohort of leprosy patients recruited from 1996 to 2006, was studied longitudinally. HIV/leprosy co-infection was associated with tuberculoid type, paucibacillary disease and lower bacillary loads. CD4 lymphocyte counts were higher among HIV/leprosy at the time of leprosy diagnosis, while viral loads were lower compared to the time of HIV diagnosis. We concluded that ART and immune reconstitution were critical factors driving the development of new leprosy lesions. **Keywords :** HIV, leprosy, anti-retroviral treatment, co-infection.

Incorporation of Statistical Modeling and Web-Based Data Collection to Provide Foundational Parameters for Correlating Laboratory and Clinical Classification

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Variations in diagnosis and mis-diagnosis of leprosy patients are a relatively common occurrence. This contributes to a delay in or missed treatment, both of which can result in increased severity, complication and impairment. Coupling a minimum clinical set of patient demographics including age, sex, voluntary muscle testing (VMT) and monofilament testing (MFT) with leprosy classification (MB, PB, TT, BT, BL, LL) and treatment regime/duration by statistical modeling to a predetermined research laboratory minimum data set including serological Western blot/ELISA using applied statistical regression yields probability prediction of conversion rates and improve accuracy in patient classification, whether TT, BT, BL or LL. Statistical modeling for clinical features as compared with sera reactive patterns using Western and ELISA pilot data is presented. The ability to compare and contrast research laboratory findings to clinical field diagnostics utilizing statistical regression analysis provide an avenue to assist in the expeditious diagnosis and appropriate treatment; thereby facilitating effective utilization of resources. The incorporation of an online database is presented as a pilot means to facilitate the accurate classification, collection and documentation of leprosy lesions including number, size, location, BI, stage, VMT, MFT and an associated minimum patient data set that is clinically relevant.

Molecular Epidemiology of Leprosy and Applications in Endemic Situations

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To better describe and compare the factors that lead to continued occurrence and transmission of leprosy against the backdrop of local and global multidrug therapy (MDT) being implemented for nearly 25 years, we have consolidated a collaborative international research program involving endemic countries in Asia (Philippines, India, Thailand and China) and S. America (Colombia and Brazil). Observations will be presented regarding the identification and distribution of patients and the *Mycobacterium leprae* genotypes in various settings to discern transmission patterns and linkages, and on the surveillance of *M. leprae* resistance to MDT in new and relapsed patients. Strain typing of *M. leprae* is currently achieved by mapping alleles at a minimum of 15 short tandem repeat (STR) loci and three known single nucleotide polymorphisms (SNPs) using DNA extracts from clinical specimens such as slit skin scrapings and biopsies. Throughput is being enhanced by multiplex PCRs, automated fragment length analyses and other DNA sequencing independent techniques. Variations in the patterns of alleles and their frequencies in *M. leprae* strains within and between geographically separated populations indicates that STR loci can be suitable for short range transmission, while also separating long range dispersion events. For detection of drug resistance to rifampicin and dapson, selected regions of the target genes, *rpoB* and *folP1* respectively, are subjected to PCR and DNA sequencing. During the year 2006, *rpoB* mutations were not detected in patients presenting in a skin clinic in Cebu, Philippines, while 2 cases were found in relapsed patients in a Colombian leprosarium. Common and novel *folP1* mutations have been detected in India and China. These efforts are aimed for delivery into the clinical community for routine diagnosis, patient care and effective leprosy control. This research is supported by grants from the National Institute of Allergy and Infectious Diseases, NIH, and the Heiser Program for Research in Leprosy and Tuberculosis through IDEAL.

Transmission of Leprosy : A Study of Skin and Nasal Secretions of Household Contacts of Leprosy Patients Using PCR

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It is generally held that dissemination of *M. leprae* is from nasal mucosa and not through the skin of infected patients. This widely held notion is based on recent findings of *M. leprae* DNA in nasal secretions vis-a-vis earlier studies in which acid-fast bacilli were demonstrated infrequently in the skin of leprosy patients. In this study we evaluated *M. leprae* in the unbroken skin of lepromatous patients using a new method for collecting skin specimens including PCR evaluation for *M. leprae* DNA. A defined area (312 cm²) of the skin from the posterior surface of both upper arms and the back of both sides of the chest was washed with a sterile cotton swab and the washings collected in sterile saline. The sediment obtained from the washings was examined by direct microscopy and PCR for *M. leprae* DNA. Biopsies of the skin were also obtained to further evaluate the location of bacilli in the skin. Results showed that 6 out of 10 untreated lepromatous leprosy patients examined histologically had acid-fast bacilli in the keratin layer. By PCR studies it was found that 8 of 10 patients had *M. leprae* DNA in skin washings and 6 of 10 had *M. leprae* DNA on swabs obtained from the nasal mucosa indicating that both anatomical sites may contribute to transmitting leprosy. Ninety-three contacts of the untreated lepromatous cases were also tested for exposure to *M. leprae* by analyzing skin washings and nasal secretions by PCR. PCR analysis showed significant skin (17% positive) and nasal mucosal (4%) exposure in contacts prior to instituting treatment of the index cases. After one month of MDT, 6 of 93 (6%) contacts tested positive for *M. leprae* by PCR from nasal secretions while 1 of 93 (1%) remained positive for *M. leprae* in skin washings. After 2 months of treating the index cases all contacts tested were negative for *M. leprae* DNA. These data suggested that 1) both skin and nasal epithelia of untreated multibacillary leprosy patients may contribute to the shedding of *M. leprae* into the environment, 2) following one month of treatment with MDT patients did not continue to shed bacilli from either the nose or skin at rates equal to that observed prior to treatment and 3) contacts of untreated multibacillary cases are at risk for contact with *M. leprae* through both the nasal mucosa as well as exposed surfaces of their skin.

Maintaining Surveillance for Drug Resistant *M. leprae* Using the Mouse Footpad (MFP) Assay

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Introduction : Although clinical resistance to leprosy drugs remains rare, it is necessary to maintain surveillance, in order to detect the trends of drug resistance patterns among patients being treated for leprosy. **Methods :** At Anandaban hospital in Nepal, skin biopsies are taken from all suitable new smear positive patients, and *M. leprae* isolated for testing in the mouse footpad (MFP) assay. Three concentrations of Dapsone and two of Rifampicin are routinely assayed. **Results :** Surveillance of drug resistant *M. leprae* has been maintained for the period 1987- 2006, during which time a total of almost 500 patients have been tested. Details of numbers of drug resistant strains detected by MFP will be presented; while no rifampicin resistant strains have yet been detected by us, an increasing trend in Dapsone resistance at all concentrations tested is detected. It is recommended that surveillance of drug resistance in leprosy be maintained, especially among patients relapsing following MDT. **Key words :** surveillance, drug resistance, leprosy.

Childhood Leprosy : Profiles From A Leprosy Referral Hospital in West Bengal

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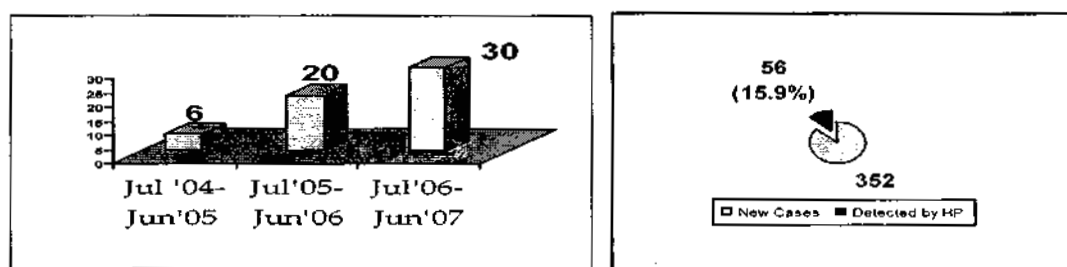
Incidence of leprosy in children is an important epidemiological parameter, and also an opportunity to treat effectively if reported early. In this paper, a profile of children diagnosed with leprosy at a Leprosy Referral Hospital in West Bengal during 2004 to 2006 is given and the implications discussed. 151 children below 15 years of age, 84 males and 67 females were studied. The sex ratio was 1.25:1 and closer to 1:1 in the younger ages 36% were below 10 years. There were 18(12%) multibacillary cases (LL, BL, BB), 42% were BT and 44% TT by RJ classification. 15(30%) of 50 MB cases had positive BI, of which 6(12%) had BI>2.00. 16% already had grade 2 disability. 25% had one nerve involved, mostly ulnar. It was surprising to see more than 5 skin lesions (nearly 40%) even in younger children 43% gave a family history of leprosy; it was 55% in the younger age-group. Leprosy in children should be urgently detected through contact surveys and promptly treated to avoid life-long suffering. **Key words:** childhood leprosy.

Is Leprosy Integration into General Health Care System successful ? - A Study in Bombay

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Leprosy program was integrated with the Health Posts (HP) of the General Health Care (GHC) System in Bombay in July 2004. We analyzed the new case detection for a period of three years in Bombay Leprosy Project's (BLP) adopted population of about 19.5 lac wherein there are 23 HPs. Following intensive and repeated training of HP staff on the "simplified information system", MDT blister packs etc were handed over to the health facility. It was expected that the GHC staff will diagnose, confirm and treat the patients. Our paramedical workers offered guidance in diagnosis, maintaining records, follow-up of patients. No surveys were conducted and IEC activities were practiced to promote voluntary reporting as per the govt. guidelines. **Observations :** From July 2004 to June 2007, a total of 352 new cases were detected in the project area. 56 cases (15.9 %) first reported to the HP at an average of 1.5 new cases per month. Most of 319 cases reported directly to leprosy referral centres & teaching medical colleges and a few practicing dermatologists and general practitioners.



Conclusion : There is a rising trend in detection by the GHC over the study period. However, to meet the objective of integration in making the GHC deal with all problems related to leprosy far more planning is needed.

Common Issues and Problems of Urban Leprosy

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Urban leprosy elimination is a problem because of absence of uniform general health care infrastructure and multiplicities and complexities of urban issues. Urban areas are governed by Local Self Governments which have constraints like inadequate resources, absence of urban primary health care, lack of awareness and political commitment. Multiplicity of providers, Multiplicity of systems and Migration. Population consists of various Social, Cultural and Economic groups. Different economic classes with varying degree of affordability and choices of access to health facilities influences the treatment seeking behavior. Unreached or uncovered peri-urban unregulated population concentration bordering the coverage areas of urban and rural health care delivery systems commonly observed around small and medium industrial towns. Integration of leprosy care in GHC has been a successful strategy in the rural areas. In the urban context, integration needs to be perceived as "building partnership" between various stakeholders to get them into NLEP network. Stakeholders should develop partnership and coordination mechanism leading to improved urban leprosy care for eliminating leprosy as a public health problem.

New Paradigms in National Leprosy Eradication Programme

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Even after achieving the goal of leprosy elimination at national level there is need to maintain the achievement made so far and further to reduce the burden of disease by expanding the scope of leprosy services. To accelerate NLEP activities and to move the programme in desired direction, certain new initiative have been taken by Government of India. These paradigms changes focus on various programme components. For measuring burden of leprosy "case detection rate" is the most relevant epidemiological indicator. Emphasis is on improving the quality of leprosy services through active involvement of General Health Care System and strengthening of referral services at secondary & tertiary level. More emphasis is being given on Disability Prevention and Medical Rehabilitation services to be provided with an integrated approach. Services of ASHA, Village Health & Sanitization Committees and Rogi Kalyan Samities formed under National Rural Health Mission are being utilized for improving health care delivery services. A comprehensive approach in the form of Community Based Rehabilitation is emphasized to maximize the benefit of rehabilitation.

Free Papers - Leprosy Control and Elimination

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Evaluation of Programmatic Actions Leprosy Decentralization : A Case Study

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Leprosy, is an endemic disease in Brazil, that constitutes a public health problem, although in the last year it has presented an important reduction in the number of cases. To revert this picture, strategies have been adopted for its elimination as a public health problem. Amongst these strategies it is stressed the decentralization of the programmatic actions of leprosy for all the basic health services of the country. An evaluation model was constructed using the Logical Model, based in a theoretical-methodological revision of evaluation in health, which essence use of matrices according to the studied object. A Descriptive Matrix, a Matrix of Analysis and a Matrix of Judgment had been created. This Logical Model of Evaluation was applied in the city of Nova Iguaçu, Rio de Janeiro state, for the evaluation of the process and the results obtained with the intervention.

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Telemedicine in Leprosy : My Experience

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Introduction : Leprosy is problem of public health in Brazil and decentralization of the new attendance to the patient strategies of education in the health will have to appear. Most modern, then, it is the sprouting of the telemedicine promote equity to the health. **Methods :** Participation of the Telemedleprosy Project of the department of telemedicine and dermatology of the university of São Paulo- (FMUSP) - the 2005 -2006. **Relact :** The suspicious patient to be with leprosy was examined in the clinic* and the digital data of the clinical fiche and photographs were repassed to the computer and later envoy to the site of the project. The patient was evaluated in the FMUSP and the people who orientates repassed its virtual and actual evaluations to the clinical fiche on line. The quarrels were kept daily. It had acceptable correlation between the diagnostic virtual and actual. **Conclusion :** Although very laborious, the training on line it was important for my auto-esteem and without a doubt it is the ideal for the qualification of the professionals who are participating of the program of leprosy. **Key words :** Telemedicine- leprosy.

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Methodology of Concurrent Monitoring of New Leprosy Case Detection in India

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Introduction : India has achieved the elimination of leprosy in 2005. Majority of states have achieved the elimination of leprosy and the remaining states on the verge of elimination in near future. The new case detection rate is 2-3 times of prevalence rate of the state. However there is wide variation on clinical profile of new cases reported across the country. The Leprosy Elimination Monitoring carried out at different interval of time covered mostly on aggregate data and a fraction of cases cross-examined for diagnosis and obtaining social data. It reveals that there are considerable number of wrong-diagnosis and re-registration. Further, the epidemiological features of leprosy are also ambiguous. It is essential to have a system converging the potential of Information Technology for studying the profile of new leprosy cases as well as its epidemiological features so as to sustain the elimination of leprosy and progress towards eradication. **Methodology :** A Methodology for concurrent monitoring of new leprosy case detection in India is proposed by means of internet web based system. Data on individual patient from districts of sentinel states will be entered into a web based system every month. The independent evaluators will collect the list of new cases reported from web system and cross-examine the new cases for diagnosis including the impairment, delay in diagnosis etc.,. The evaluator's data will be entered into the other module of the system and necessary tables generated yearly. This proposed system strengthen and promote accuracy of micro level data at National level and enhance our knowledge on leprosy.

Free Papers - Leprosy Control and Elimination

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O-154**Integration of Leprosy Control into Primary Health Care Services at District Level in the Republic of Yemen**Abdul Samid Al-Kubati¹, Abdul Rahim Al-Samie² and Yasin Al-Qubati³¹National Leprosy Elimination Programme, Taiz, Yemen, ² Faculty of Medicine Taiz University, Yemen

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Summary : The aim of this work is to test the effectiveness of more training for the Primary Health Care Workers (PHCWs) to help integration of Leprosy control in Primary Health Care System (PHCS). It was started in Nov. 2006 in eight (8) Districts in Republic of Yemen. The selected districts were known as moderately endemic areas for leprosy. A convenience sample of 120 Health Center and units (HU) was selected as a pilot project. 127 Health workers were subjected to one day training on Leprosy diagnosis and treatment. They were subject to evaluation of their knowledge before and after training. The results showed poor knowledge before training and marked improvement after training. After training, the trainer distributed MDT blister packs, registers and health education materials to all participants. In the following nine-month a follow up visits to the PHCWs were done by the Leprosy focal points in the targeted districts. Fifteen new leprosy cases were detected by the trained Health Workers in 9 months. Suspicion of leprosy and diagnosis abilities of the PHCWs were improved and the cases detection increased in the period after training. This intensify the need of repeated training for PHCWs, monitoring and supervision in leprosy control specially where ever a weak primary health care services existed and in hypo endemic areas where leprosy is fading away. **Keywords :** leprosy, integration, primary health care services, Yemen.

O-155**Modified Leprosy Elimination Campaigns - Why, How and What ?**

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The World Health Organization recommended the Leprosy Elimination Campaign (LEC) with aims to detect leprosy cases, particularly the cases of consequences, remaining hidden in the community and treat these with MDT. Passive case detection was advised. India got it slightly modified to suit its need. The modification mainly was in introducing active house to house search and shortening of each campaign period to a month with only 6 days for case search. While WHO proposed LEC as a one time intervention, India carried out 5 such MLEC during 1998 to 2004. Each of the five campaigns varied in the area of coverage based on epidemiological need. Similarly case detection procedures also varied. Methodologies adopted in these five campaigns give a clear picture of changes that were needed at the time in the country. The MLEC, changed the entire scenario of NLEP in India, bringing out a number of lesson to be learnt and utilized. The impact of these campaigns started showing after about 5 years of the 1st MLEC, in stabilizing the new case detection and also actually bringing down new cases thereafter. The MLECs were a boon to the people of India, supported strongly by the community and had political as well as administrative backing, resulting in unexpected achievement in a very short period of time.

O-156**Can We Reconsider Skin Smear Examination in NLEP ?**

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Introduction : When MDT was introduced in the leprosy control programme in 1983, skin smear examination was a prerequisite for diagnosis and classification. But after a few years of experience, it was observed that this test remained the weakest link and was viewed as a serious obstacle in wide use of MDT. In the subsequent WHO guidelines, it was suggested that skin smear examination is not mandatory. KORALEP continued this service for referred as well as voluntary reporting cases. This is an analysis on smear report of such cases. **Methodology :** Skin smear examination of OPD patients continued in Koralep. The smears are mostly taken from 4 sites, stained with standard procedure and graded in Ridley scale. A total of 1180 smears were examined in this laboratory from January 2005 to July 2007 and the result is presented in the following table. **Results :**

Year	Slides	Neg.	%	Pos.	%	0.1-1	1.1-2	2.1-3	3.1-4	4.1-5	5.1-6
2005	491	424	86.3	67	13.7	25.5	10.5	11.5	22.5	27	3
2006	555	496	89.3	59	11.7	16.9	22.3	11.8	23.7	15.2	10.1
7/07	134	108	80.6	26	19.4	23.1	23.1	11.5	15.3	19.2	7.8
Total	1180	1028	87.1	152	12.9	21.8	18.6	11.6	20.5	20.4	7

Attempt was also made to find out the approximate distance from which the patients came to avail the service. Among the 152 persons whose skin smears were positive, 92 cases (60.5%) was found to be in the radius of 25 kms. from the laboratory. High BI is found in about 50%. **Conclusions :** 1. Of the 1180 examined, 152 (12.9%) were positive for AFB. 2. Skin smear examination needs to be reemphasized at-least through few surveillance units. 3. This analysis gives an impression that 'if there is facility there are patients' **Key words :** Skin smear, MDT, AFB.

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Various interventions have been introduced for improving early case detection in leprosy without assessment of their cost in relation to expected impact. This study in Bangladesh compares the cost and effectiveness of two interventions using lay people. After studying the help-seeking behavior of registered leprosy cases, we selected two interventions: "street drama" and "house to house visiting". Sixty trained volunteers were deployed for 6 months. Weekly data on suspects presenting and new case detected was collected for 12 months from concerned two subdistricts and a "control" subdistrict. Both interventions were associated with an increase in suspects presenting, and in the new case detection rate. Cost per extra new case detected was approximately 13000 taka for street theatre and 6000 taka for house-visiting. In this district, Street drama seems to be the more efficient of the two methods to raise public awareness. This methodology could be adapted for assessing effectiveness of other interventions elsewhere. **key words** : early case detection, Public awareness, volunteers, street drama.

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Introduction : The highest new case detection rates of 17 and 12 per 100,000 in Sri Lanka were observed in 1990, the first year of Social Marketing Campaign and in 2001, the first year of the integration of leprosy respectively. In both years, the launching of the programmes was accompanied with aggressive media campaigns through out the country. Steady decline of NCDR was observed in the following years since launching of both SMC and integration. With a launching of community awareness programme, increase in NCDR, PB rate, and patients reporting in the early stage of the disease (low lag time) and decline in deformity rate have been observed. The lowest NCDR of 9/100,000 after integration was observed in 2005, where no special field activities due to various reasons, one being the changes in the two partners (Novartis Foundation of Sustainable Development and Lepira.ch). The present study attempts to find out the relationship between the lag time and few selected variable in a year of low activity from retrospective data. **Methodology** : At the first stage of the study, annual statistics of national and provincial data relevant to selected variables for the year 2001 (high NCDR) and 2005 (low NCDR) were compared using contingency tables. Chi Square is used to find out significance of relationship. Of the 9 provinces of Sri Lanka, Northern Province was excluded as the number of new cases is very low and also due to the incompleteness of some of patients forms. Provinces were classified as high, intermediate and low endemic based on the prevalence from 2001 to 2005. New patients seeking treatment within one year of the onset of symptoms were classified as 'early reporters' while those who seek treatment after 2 years were classified as 'late reporters'. Both grade 1 and 2 patients were grouped as those with disabilities. At the second stage, national and provincial data of 2005 were analyzed in order to find out the relationship between the lag time and three selected variables i.e sex, type and disability. **Results** : High endemic Western Province has shown less number of late reporters in 2005 (low activity) when compared to that of 2001 (intensified activity). It is highly significant. The second high endemic Eastern Province has shown statistically significant number of MB patients among late reporters in 2005. One of the 'intermediate' endemic provinces, North- Central has shown significant reduction of late reporters and females among them. High endemic western province has shown significant increase of patients with disabilities among late reporters in 2005. **Conclusions** : Western province though with high literacy rate and easy accessibility to MDT services, patients report in the early stage as the awareness is high. In high endemic areas deformity rates are high and these patients take long time to seek treatment.

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Introduction : As information was needed to develop human resource strategies, this study aiming at identify working performance of Regional Leprosy Coordinators (RLCs) and related factors. **Methodology :** Descriptive study using in-depth-interviews in 42 health officers consisted of 12 RLCs working at different regional areas, and 30 involved health officers. **Results :** RLCs perform vertical role despite of integration era, and not being able to conduct supervision sufficiently. Related factors were; attitude, ability, and motivation. RLCs had positive attitude and enough abilities. Motivation contributing factors were; courage and discourage. Courage factors were; positive attitude, cooperation from colleague, task suit their abilities, and colleague's acceptance and respect. Discourage factors were; unsupported policy, and uncomfortable and inconvenience communication with national leprosy staff. Recommendations from interviewees were; RLCs should improve themselves, national leprosy organization should help RLCs to overcome their difficulties individually. National leprosy staff should work in multidisciplinary team and the same direction. **Conclusion :** Issues should be taken into consideration to develop human resource strategies were; RLCs' vertical role, unsupported policy, unfavorable communication with national leprosy staff, and interviewees' recommendations. **Key words :** leprosy, working performance, leprosy coordinators.

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This participatory action research mainly emphasized on participation of leprosy workers who could expressed their opinion about pattern of leprosy control service in Bangroud district, Buri Rum province Thailand. The study is aimed to develop the appropriate pattern of leprosy control services to reach the goal of sustainable elimination of leprosy. We used technique future search conference (FSC) and appreciation influence control (AIC) and collected data to plan for adjustment leprosy control services and analysed their results by further content analysis. The overall results revealed that they had appointed Bangroud district's leprosy committee organizing, leprosy training program for leprosy workers and establishment of anesthetic skin clinic as private and one stop services. They had together conducted activities in active and passive case findings and had made the leprosy guidebook, or with organizing meeting every 3 months. The anesthetic skin clinic was under responsibility of by a register nurse at the out patient departments of Bangroud hospital. In additions they also established a rapid village survey team, in which including also performance screening leprosy cases for students in the school. Further more, primary health care sector units had been established in order to prepared community for rapid village survey, Giving the leprosy health educations, screening and followed up of the default leprosy patient. They finally conclude and recommended that : this study would be useful for the development of the system of leprosy control services, as for planning for further activities, it was necessary to follow the principle of Mutual participation. Mean while, the established anesthetic skin clinic should be responsible by registered nurses of the out patient department of the district Hospital. Last but not least, not working of any related organization beyond the hierarchy of the ministry of public health should be clearly developed in order to achieve better systematic collaboration for supporting the more effective, Sustainable and integrated leprosy control service. **Key words:** participation development.

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Impact of Universal Coverage of Health Care Insurance on Effectiveness of Leprosy Control and Elimination Program in 12 Provinces with High Prevalence Rate (over than 0.50 to 10,000 populations) 2001-2006 Thailand

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Summary Objective : To determine the impact of universal coverage of health care insurance on effectiveness of Leprosy control and elimination program in 12 provinces with high prevalence rate in 2001-2006. **Method :** Descriptive study using questionnaire in 345 staffs of Leprosy control and elimination program department of PCU, CUP, CUS and CUT from central hospital, general hospital, district hospital, local health center and co-ordination staffs in central, district, province, community by mail. Analysis by content analysis. **Result :** Impact of universal coverage of health care insurance are 1) Leprosy is more accepted and no problem 2) Less staff and work load 3) less effectiveness in term of control and prevention, cure and care is more difficult, search for patient activity is more difficult to do, refer system from one department to another make the patients waste time and opportunity to be cured. Prevention of disability is reduced. 4) Budget allocation is reduce and no direction depends on yearly government budget. 5) The patients are not confident in local service, they do not prefer to use local hospital because they want to keep secret. **Conclusion :** Implementation of universal coverage of Leprosy control and elimination plan has reduced effectiveness of working therefore opportunity to have the disease spread in the community is higher. Suggestion 1) Organize the clear planning and integration with other diseases. 2) Allocate sufficient budget 3) Instill motivation to staff **Key words :** leprosy, universal coverage, effectiveness.

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Epidemiologic Situation of Leprosy in Minas Gerais State, Brazil, From 2001 to 2006

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The leprosy prevalence in the State of Minas Gerais have been decreased 22 times in the last 15 years, but the number of new cases in leprosy is around 3,000 which reflects the necessity of other strategies to control this endemic. In 2006, 406/853 (47.6%) from the municipalities of Minas Gerais notified new cases of leprosy, being 19.7% of them hyper endemics, 21.1% with very high detection, 30% with high detection, 27.3% with medium detection and 2.2% with low detection. The rate of general and children detection show decreasing tendency. The rate of accumulated detection shows that the biggest problems of the state are in 18% (5/28) of healthy regions. At the diagnosis 96.7% of new cases detected have been the disability degree evaluated, but the same situation didn't occur when finish treatment. The cure rate is higher than 80%. Although the decreasing of general detection rate and in the number of new cases, different strategies will be necessary in order to control the endemic. **Key-words :** leprosy, leprosy/epidemiology, leprosy/control.

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Satisfaction of Leprosy Patients Under MDT Services at Lepra Project, Bargarh

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Introduction : LEPRO Society started a project in Bargarh in the year 2001 when the PR was 27.7. MDT services gradually integrated into the GHC system and the PR came down to 10 in the year 2004. The patients received leprosy services from the GHC system with additional support from LEPROA mostly in IEC, capacity building and complication management. To assess the satisfaction of the beneficiaries this study was undertaken. **Methodology :** All MB cases declared RFT during the period from April 2003 to March 2004 and PB cases during October 2003 to March 2004 were included in the study. The information was collected through a structured questionnaire and the findings were analysed. **Result :** Distribution of male, female and child, MB/PB ratio, deformity rate is similar with that of the district and the State. Regular MDT collection and patient counselling are more than 98% whereas regular patient examination is around 92%. 78% of patients reported disappearance of patches whereas 44.8% reported improvement in nerve lesions. About 94% patients perceived that they are cured from leprosy. 40% patients felt of being discriminated of which 8% at home and 92% at institutions. 88% patients receive treatment within 3 kms. from their home. Around 46% of patients still want to know more about leprosy. **Conclusion :** This study clearly indicates that the leprosy services are successfully integrated in the GHC system. The study does not compare with the situation, where only GHC system provides MDT services. **Key words :** GHC, MDT, IEC.

Added Value of DTSTs in Mainstreaming Leprosy Services in Andhra Pradesh A 5 Year Experience

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Andhra Pradesh was one of the high endemic states for leprosy and NLEP was implemented as a vertical programme. The leprosy services were integrated into general health care since 2002. District Technical Support Teams were introduced by ILEP to mainstream leprosy services. The DTSTs were placed with an objective of enhancing the capacity of health facilities to diagnose and treat leprosy patients with MDT and improve community participation. DTST comprised of a trained and experienced medical officer and para medical supervisor with additional facilities of mobility. Capacity building is the major activity and DTSTs trained all the health staff using lecture and case demonstration as teaching tools. With the five year period, 13480 (1618 PHCs; 11862 Subcentres) health facilities were covered by the DTSTs. In addition to capacity building, support was given to the district leprosy officers and his team in managing the information and MDT supply. At the end of five years, the proportion of Health facilities providing correct diagnosis and MDT increased from 60% to 98% in Andhra Pradesh. 95% of the health facilities reported availability of MDT as per the guidelines of NLEP. All the health facilities submitted NLEP reports in prescribed Simplified Information System (SIS) formats for monitoring the programme. Details of DTST activities and the achievements will be discussed in the paper to indicate the added value of DTSTs in NLEP.

Contact Intervention : An Effective Measure for the Reduction of Leprosy

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One of the most important risk factors for acquiring leprosy is close contact with a patient. Objective: To estimate the reduction rate of leprosy among contacts induced by their index case (IC) treatment or by both their BCG vaccination and IC treatment. The study was carried out at the Outpatient Clinic, FIOCRUZ, between 1987-2007. The attributable risk was obtained by comparing the difference between the cumulative incidence (CI) of leprosy among contacts at start MDT of index cases, compared with CI among contacts after starting IC treatment in both vaccinated and not vaccinated contacts. Results: Out of the 5,966 contacts from the 1,180 IC examined, 305 (5.1%) were diagnosed with leprosy concomitant to their index cases (co-prevalent cases). An additional 125 (2.21%) contacts were diagnosed during follow-up (incident cases). The highest CI at intake was observed in contacts under 15 years without BCG scar (14.7%). The reduction of leprosy among contacts was highest when MDT plus BCG vaccination were used (67%). Contact examination and BCG vaccination are an effective measure for reducing the risk of leprosy and the transmission of the disease especially in children under 15 years. Keywords : Leprosy, contact tracing, cumulative incidence, Brazil.

Scaling-Up Leprosy Diagnosis and Management in Coast Province, Kenya

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Introduction : Although leprosy care has improved through the introduction of multi-drug therapy and prevalence has continuously declined in Kenya. It remains a problem in a few districts, with approximately 200 cases reported annually. Therefore, it's important for health care workers to maintain adequate knowledge and skills required to detect cases early and treat. **Methodology :** 3-day educational workshop was developed to strengthen clinical and diagnostic skills of health care workers. This was carried out in Coast Province where leprosy prevalence is the highest in the country. **Results :** Post workshop, case detection rose from 54 in 2005 to 101 in 2006. This indicates the importance of maintaining clinical skills for health care workers in leprosy endemic regions. **Conclusion :** As the TB epidemic continues to grow despite control efforts, it consumes a significant amount of the available funding. Leprosy post-elimination activities are left with insufficient funding to carry out necessary control activities required to eradicate leprosy. If additional funding was available, it could be used to provide continual education to maintain clinical skills and improve case detection. An improvement in these activities could lead to earlier treatment, reduction in deformities and a decreased prevalence.

The Participation of Civil Society in the Definition of Political Control of Hansen's Disease in Brazil

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The National Policy of the control of Hansen's disease in Brazil recommended compulsory segregation of all cases until 1961 when the treatment and care became ambulatory. Nowadays the infected person is admitted to hospital only when there is clinical indication and therefore, the leprosy hospitals that practiced segregation are going through a transformation process and insertion in the general net of the health system. The objective of this study is to present the participation of the civil society in the definition of control policies through a bibliographical review identifying its influence in the norms and laws which established the policy control of Hansen's disease in the country. The results show that the civil society had an important role from the beginning of the past century even though exercised little influence in the government and only made real changes being noted from 1981 on with the creation of the Movement for the Reintegration of people affected by Hansen's disease (MORHAN). The propositions of this movement have been slowly incorporated in the norms of control showing a real participation process in the definition of the national policies of control of this endemic disease.

Lot Quality Assurance Sampling of Leprosy Cases in An Urban Municipal Ward in Mumbai and in A Rural Unit in Raigad District - India

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Introduction : India declared that it had reached the goal of leprosy elimination in December 2005. This was achieved through campaigns and focused activities in endemic areas, while simultaneously strengthening the general health services to take over leprosy activities. Maharashtra is also one of the states which reported a prevalence of 0.95/10000 population in 2005. **Objective and methods :** The Foundation for Medical Research in collaboration with 2 NGOs, all experienced in leprosy work over three decades, was conducting a survey using lot quality assurance sampling (LQAS) method, combined with a scientific diagnostic approach in 2 different health settings i.e. rural and urban with the aim of confirming the prevalence, where the reported PR was 1.2 and 0.7 respectively. **Results :** In the rural set up a house to house (primary) survey carried out by field staff detected 98 active cases, where 120'649 people were examined out of which 35 were MB and 63 were PB cases, PR being 8.1/10'000. In the urban municipal ward 78 active cases were detected, where 343'639 people were examined out of which 24 were MB and 54 were PB cases, PR being 2.2/10'000. Evaluation by FMR: Of the 153/176 cases examined (23 cases yet to be evaluated) 147 were new cases and 6 were found to be relapse cases. Study of lesional biopsy done in 106 cases, showed a good concordance between clinical and histopathological classification in 101 cases (95.2%). Among the confirmed new cases, in the rural set up 11/22 (50%) of MB cases were smear positive. From overall cases 27% of were children, 16% of rural cases presented grade 2 disability at diagnosis (G2D). In the urban area 7/24 (29%) of MB cases were smear positive. From urban area of all cases 37% were children, 5% of all urban patients presented with G2D at diagnosis. Delay in diagnosis of more than 1 year was seen in 29% of all the detected cases. The study will eventually be extended to a 200'000 (rural) and 700,000 (urban) population. **Conclusion :** House to house survey, using lot quality sampling in the rural and urban setting revealed a considerable backlog of active leprosy cases in the population under observation. The actual PR was found to be 3 to 7 times higher than what was projected by the leprosy programme. The high proportion of child cases and the large number of smear positive MB cases imply ongoing active transmission of mycobacterium leprae. Together with the high grade 2 disability rate, these indicators suggest an impaired access to the health services for the population. The concept of leprosy case detection based on voluntary reporting seems not to be sufficiently effective in the two examined settings. **Key word :** LQAS, leprosy, scientific diagnosis, prevalence, grade 2 disability, active case detection, voluntary reporting, access to health services, India. **Funding :** Swiss Emmaus Leprosy Relief.

Changing Trend in the Profile of New Case Detection in Leprosy Before and After Integration – A Comparative Study

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Despite the involvement of a large number of GHC staff following the integration, the number of new cases detected has not shown an increased trend. This can be partly attributed to the cessation of active case finding activities. Profile of 1650 new leprosy cases registered in the leprosy clinics of ALERT-INDIA (3 Municipal wards of Mumbai) from October 2001 to September 2007 were analysed. Trends such as sex, age and clinical features were analyzed and compared with active (population and school surveys) and the passive (voluntary reporting propelled by intensive IEC campaign) methods of case detection. The proportion of new cases detected through active and passive methods were similar. The proportion of MB cases (34%) and Gr. II deformity cases (8%) has increased in passive than active method. Study also revealed that more number of male cases (7%) and smear positive MB cases (13%), but less number of child cases (43%) were detected by passive method. A downward trend in new case detection with both the methods was observed, thus indicating a possible gradual reduction in the incidence. The profile of new cases detected clearly indicates late detection after integration. This calls for an effective measure that can contain this trend during the integration phase. Need for focused and sustained leprosy awareness activities through community participation were stressed. The limitations of key indicators used to measure the leprosy burden today need to be defined differently due to discontinuation of active case detection methods following integration.

Health Systems Research Training in Brazil : Seven Years of Experience for More Effective Hansen's Disease Control Programmes

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In Brazil, although progress has been made in Hansen's disease control (HDC), efforts have been hampered by information gaps. Health Systems Research (HSR) aims to collect the necessary data to provide information. Five HSR courses on HDC were organized by two NGOs, Netherlands Leprosy Relief and British Leprosy Relief Association, in association with Brazilian Federal Universities between 2001-2007. Key personnel working in HDC were invited to participate. The research proposals were developed during an HSR workshop and carried out in the field, and included: the integration of HDC programmes into the primary health care system; the high percentage of the new patients diagnosed/treated at referral centres; the psychological/social impact of surgical rehabilitation; the efficacy of neurolysis; the quality of contacts evaluation; the impact of migration in HDC; the quality of the national health information system; the effectiveness of new case detection and health education campaigns. Following the completion of the field work, the data were analysed and a research report written. Practical outcomes include the drafting of new HDC guidelines; improvement of national databases and the revision of epidemiological data. HSR is an important vehicle for human resource development and a practical tool to improve the effectiveness of HDC programmes.

Delay on Leprosy Diagnosis in Childhood Leprosy

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Introduction : Brazil has the highest childhood leprosy detection rate all over the world and in 2006, 8% of the total leprosy patients were children. The objective is to determine the about the delay and its reasons on leprosy diagnosis in patients younger than 15 year-old. **Methodology :** Prospective study carried through in Vitoria, Brazil, with 18 children diagnosed and treated for leprosy in 3 Health Units. As statistical package and data base was used SPSS 8.0 for Windows. **Results :** Of the 18 studied patients, a half was boys and a half, girls. The mean of age was 8.83. Fourteen (78%) were PB and 4 (22%) were MB. The delay on leprosy diagnosis was higher in MB than in PB ($p=0.031$). In 9 (50%), the delay occurred because the parents failed to seek medical attendance; 5 (28%) because difficulties on getting medical consultant; 4 (22%) because many wrong diagnosis made by the physicians. **Conclusions :** Delay on leprosy diagnosis is associated with MB form, the most serious and infectious forms. Therefore, the population and physicians need to acquire more knowledge about leprosy occurring in childhood, made the diagnosis and start treatment as soon as possible in order to avoid disabilities caused by leprosy. **Key Words :** leprosy, childhood, delay on diagnosis.

Independent Study to Establish the Efficacy of the Six Doses Uniform MDT Regimen for Leprosy Patients

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The proposed 6 months uniform MDT (UMDT) regimen for all leprosy patients may not be easily accepted without evidence of efficacy for high BI leprosy patients. This study plans to include 2122 patients from north-northeast Brazil, at least 400 with high BI. The intake of single lesion patients will be limited to 100 patients. Histopathology, skin smear bacilloscopy and ML Flow anti PGL-I serology have been performed. Adverse reactions and MDT side effects are also monitored once a month. The follow up of patients will be for six years. Up to now, 250 patients were included, 60% of them are multibacillary, 40% of patients present AFB and 40% were seropositive. Among leprosy patients, 25% present BIe” 3, which will totalize around 500 patients within this category. Few patients (4.4%) needed to be dropped out of the study mainly due to dapsone side effects. **Funding** : Brazilian Ministry of Health, National Counsel of Technological and Scientific Development (CNPq) / MS-SCTIE-DECIT – Protocol N° 403293/2005-7. **Keywords** : leprosy, treatment, epidemiology, control.

The Potential Role of Telemedicine in Improving Leprosy Control to Remote Underserved Areas of Amazonas State, Brazil

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There is current interest in the role of telemedicine in improving dermatological care to remote underserved areas. The Brazilian Amazonas State has a large territory with disproportion of specialist expertise covering due to existence of 62 dermatologists in Manaus, the capital, and none in the interior and high incidence of dermatological diseases including leprosy. This study aims to evaluate whether a low-cost telemedicine system could provide technical supervision, advice, referral services within an integrated leprosy control approach. Four municipalities in the interior and a Reference Center in Manaus participated in the study. Skin conditions were imaged with analogical or digital cameras and sent by regular or electronic mail along with standardized history form from basic health units to the Reference Center. From January 2006 to September 2007, a total of 83 patients were included. The study population contained a variety of dermatological conditions, including leprosy. These data support that telemedicine could contribute for leprosy specialized referral services to be part of general health services, giving technical support to the rural health teams. **Key-Words** : Telemedicine, Leprosy, General Health Services.

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Jakarta is the capital city of Indonesia, that is occupied by for almost 10 million people and consists of 5 municipalities and 1 district. Even though Jakarta has already declared as a Leprosy eliminated province since 5 years ago, it does not mean that the leprosy problem is being resolved. Data from Provincial Health Office (PHO) indicated that there has no significant declining trend of new case detection for the last five years. The leprosy still evenly spreads in Jakarta. 185 out of 264 PHCs in Jakarta had leprosy patients. Urbanization was thought to be as one of a potential cause. This study aim to identify the dynamic and of quality of treatment and also contribution of leprosy patient who living out side Jakarta to the leprosy burden registered in Jakarta. The study subjects were all of registered leprosy cases in 40 PHCs and 4 public hospitals in Jakarta in 2005. The secondary data was gathered from patient register using a template that developed for this purpose by trained interview. Analysis was done descriptively. The completeness of the patient register is a main problem both in PHC and Hospital. In some variable the uncompleteness is ranged from 20% to 39.5%. Hospital was more preferred than PHC. Two out of three leprosy patient sought medical care in hospital. Case detection rate was 9.2 per 100,000 population. The proportion of child case was 7.6-8.1%, disability rate was 5-20.7%. Only 10% of the respondent followed by contact tracing examination. The proportion of leprosy patient in Jakarta who reside out side Jakarta was 11.7%. Most of leprosy patients reside in West and South Jakarta sought medical care in Central Jakarta hospital. Meanwhile the respondent who reside in Central and East Jakarta sought medical care in their area. Only 16% of respondent could be interviewed. Reasons for not interviewing were; the address was not complete, wrong address, the address was not exist, moving to unknowing and unidentified place, out of city; and refused to be interviewed. The proportion of leprosy PB patient who received 6 blisters was 31.9%. The proportion of leprosy PB patients who were over treatment was 45.5%. The proportion of over treatment were higher in Hospital compare to Puskesmas (two fold). The figure for MB patient had not been analysed yet since some of them were still in the course of treatment during data collection. PHO should put the capacity building as a higher priority in their program by increasing the knowledge and skill of health provider in dealing with completeness of patient register. Introducing the direct observed treatment (like TB patient) for leprosy patient to increase the adherence for treatment should take to be consideration. Employ cadre for contact tracing examination is one alternative to increase the contact tracing rate.

Leprosy Control Programme in the Dominican Republic : 40 Years of Work (1996-2006)

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Dr. Huberto Bogaert and followers created the Patronato de Lucha Contra la Lepra in 1963, a non-profit organization to raise funds to control leprosy. Active and passive surveys for leprosy detection had been carried along with education to populations and training to physicians. So far 12,156 patients had been treated, 10,954 are already released, 307 are taking multidrug therapy and 882 are on surveillance. The prevalence reached a peak 8.29/10,000 in 1979. Afterwards it has been decreasing reaching the 1.00 World Health Organization goal in 1994 and 0.35 at the end of 2006. The highest incidence were recorded in 1974-1977 with more than 400 new cases each year, 1988 was the last with 300 and 2003 with 200. The predominance of new cases has changed to paucibacilar the last few years. The proportion of children among new cases has decreased from 20-25% during 1966-1988 to 16% in 2003-2005 and 8% in 2006. The degree of disability of the new cases has decreased to 3%. **Keywords :** Leprosy, mycobacterium, Dominican Republic.

Knowledge, Attitude and Practice Towards Leprosy of the Population in "Urban Health District of Kinshasa"

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Context : In Kinshasa, DRC, the proportion of leprosy patients having disabilities among new cases remains high, Reasons of late consultations were investigated in a survey conducted in the Urban Health District of Kinshasa. **Objective :** Describe in the population of Urban Health District of Kinshasa, the level of Knowledge, Attitude and Practice towards leprosy and determine the sources of information. **Methods :** A descriptive cross-sectional survey was conducted in September 2005 in Kinshasa Urban Health District among adults of 18 years and over in household. Investigators interviewed 300 persons using a standard questionnaire. **Results :** Majority of interviewees ignore early signs of leprosy. Churches appear as main sources of information about leprosy awareness. Stigma about leprosy is high. **Conclusions & Recommendations :** Lack of awareness and stigma about leprosy are evident. Emphasis should be put on recognition of leprosy early signs. Revealed sources of information should be efficiently used.

On Elimination of Leprosy in Russia

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The aim : monitoring of leprosy in Russia. **The methods :** sanitary-statistical, epidemiological. The incidence of leprosy in Russia has sporadic character, during the last 20 years 15 new patients were found, mainly with LL. There are 544 leprosy patients registered on 01.01.07. mainly of old age (80%). In this conditions the task is medical and social rehabilitation, prevention of disability and relapse, development of diagnostic methods, methods of treatment of accompanying diseases, increase of life quality, work with disease distribution. The growth of leprosy prevalence may be caused by change of biological properties of *M. leprae*, appearance of resistant strains with increased virulence and pathogenicity persisting for a long time in organism of treated patients. There are some other ways of distribution : reservoir of infection in animals, soil, water, sporaformation *M. leprae*. Serological methods of leprosy control with immunodiagnostic test-system became significant. Sanitary-educational work must not be decreased to increase effectiveness of social rehabilitation, avoidance of leprophobia. It is necessary to continue to study the epidemiology of leprosy (source of infection, ways of transmission), pathogenesis of nerve damage, to develop methods of early diagnostics, prognosis of relapses and complications, cultivation and vaccine creation. **Key words:** dispensarization, elimination, leprosy control.

Strategy of Leprosy Elimination in Republic of Uzbekistan

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The purpose: Studying of dynamic of leprosy elimination. **Methods :** epidemiological. The registration of leprosy's patients in republic was regulated to 1930, and in 1931 was opened the first hospital for leprosy patients, and the second in 1933 in Karakalpakistan. By the prevalence of leprosy Uzbekistan is divided for strike zone (North part) and successful (South part). To the North part is belonging Republic of Karakalpakistan (Muynakskiy, Tahtakupirskiy, Chimbayskiy, Nukusskiy, Hodjelinskiy regions), and to South part – Horazmskiy, Surhandarinskiy, Kashkadariyinskiy regions and districts. The highest index of leprosy in Karakalpakistan was in 1960 and formed 30.4 for Karakalpakistan at all and 43.7 for North zone, while in South zone it was sporadical. The highest prevalence was registered in near Aral North zone of Republic. As a result of complex antileprosy actions in combination with improvement of population's economical and cultural life, in 1978 the leprosy prevalence fell till 0.56 to 100 000 of population. During the next 25 years the leprosy prevalence was falling till 0.06 (in 435 time in period since 1960) i.e. it accepted strictly sporadical character. **Key words :** Leprosy, Elimination.

Defaulter Status of MDT Treatment in An Integrated Service in the Year 2006, in Bihar

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Introduction : Regarding the course of therapy, we do not have any information about the defaulter leprosy patients, who did not turn up here, after being referred to their respective PHC, after initiation of the first monthly dose of MDT, from this hospital. This study will enable us to know the reason behind this, and the completion of their course of MDT therapy from the respective PHC.

Methods : The study consisted of two teams. Each team consisted of two persons, ie a trained worker in the field of leprosy, and an accompanying volunteer. The duration of survey was of a month. The study started on 22.6.07 and concluded on 21.7.07. They went to the respective PHC and locality, and followed up the patients from there. Each team was given a motorbike for their means of communication. Their job was to visit the respective PHC and their locality, to enquire about the MDT treatment of the referred patients.

Results : The various reasons for defaulting included: migration to other states: - 12 (28%), MDT not available at PHC: - 11 (26%), not willing to accept the diagnosis: - 4 (9%), expired: - 2 (5%), incorrect mailing address: - 4 (9%), social stigma: - 2 (5%), other health problems: - 2 (5%) and PHC far away: - 6 (13%). **Key words :** leprosy, defaulters in MDT.

A Study on Case Validation Done by District Technical Support Teams, Uttar Pradesh, India

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Introduction : After the Vertical Leprosy Programmes are integrated into the General Health Services, it is important to validate at least a proportion of the new cases detected at all the health facilities. ILEP supported DTSTs were advised to take up this activity together with the District Nucleus Staff in all the districts. The data obtained for July to September 2006 quarter is analysed and discussed. **Methodology :** The teams visited the patients in their villages / at PHCs and validated them using a Standard Proforma. The new cases both MB and PB which were detected within one to three months were assessed. The data collected on 2308 cases is analysed and presented.

Results :

No. validated	1956	(84.7%)
Not available on visit	352	(15.3%)
Found not existing on enquiry	34	(1.7%)
Re-registered	44	(2.2%)
Migrated	21	(1%)
Died	0	(0%)
Wrong diagnosis	52	(2.8%)
Wrongly classified	55	(3%)

The intricacies and significance of the results of this exercise will be discussed during presentation.

Defaulting for MDT-Multicentric Study

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Adhering to a treatment schedule and completion are crucial to the control of any disease. Hospital based MDT services have over the years shown much lower treatment completion rates than leprosy control programmes. This has been a cause of concern. Several studies in India have addressed the issue of non-compliance to treatment and defaulting. As long as defaulters continue to live in the district and have yet to complete the full course of MDT treatment, they remain potential sources of infection, and the patients suffer from irreversible complications. A total of 6291 new untreated cases of leprosy received MDT in the year 2000, 2001 & 2002 in six TLM hospitals were followed up of which 2754 are from within centers and 3536 from outside centers. The overall defaulter rate for both within & outside is nearly 46% & 60% for including 1st dose. While excluding the 1st dose, the defaulter rate reduces to 37% within and 50% outside. Detailed analyses by age, sex, type of leprosy and number of pulses taken are analysed by geographic area for defaulter rates and the possible reasons thereof. It is concluded that much education and motivation is needed to reduce the high defaulter rates. **Key words :** defaulters in MDT.

Timing of Self Reporting for Treatment; Myths and Practices : Some Interesting Findings Among Fresh Reporters at an Outpatient Treatment Centre in Uttar Pradesh

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Introduction: Patients report for diagnosis and treatment at different times during the course of their disease. This study aims to study various influences that ultimately drive the patients' home. **Summary :** More than 500 [average annual no.] cases were counseled individually at their maiden visit to the hospital. During this an interviewer administered questionnaire was done for each patient on 5 most important drives. The results were pooled and analyzed. The results were presented according to patients' own grading. A treated patient's advice is found to be the top driving force followed by family and finances. **Key words :** self reporting, myths and practices.

A Single Dose of Rifampicin is Effective in Preventing Leprosy in Contacts of Newly Diagnosed Leprosy Patients. Results of a Cluster Randomised Controlled Trial

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Background : Close contacts of leprosy patients have an increased risk of clinical leprosy, the disease caused by *Mycobacterium leprae*. Uncontrolled and unblinded studies have shown that rifampicin is possibly an effective prophylactic drug against leprosy, but for routine application it is necessary to establish its effectiveness through a double blind, placebo-controlled trial. **Methods:** A single-centre, field based, double blind, cluster-randomised and placebo-controlled trial was carried out among 21,711 close contacts of 1037 newly diagnosed leprosy patients. Prophylaxis consisted of a single dose of rifampicin given to close contacts in the second month after the beginning of treatment of the patient. The data were analysed blindly at follow-up 24 months after the intake. **Results :** Out of the 21,711 included persons, 19,957 (91.9%) were seen at follow-up. In the placebo group, 66 out of 10,006 developed leprosy. In the rifampicin group this was 29 out of 9951. The overall reduction in incidence by a single dose of rifampicin was thus 56% ($p = 0.0003$). The overall number needed to treat (NNT) to prevent a single case of leprosy among contacts was 271. There were differences between subgroups, both in reduction of incidence and in NTT. **Conclusions :** The effectiveness of 56% of a single dose of rifampicin given to contacts of new leprosy patients in preventing the development of clinical leprosy is a promising finding with regard to the potential of this intervention in leprosy control. The effect however, is not consistent in all subgroups of contacts and this has implications for our understanding of the early pathogenesis of leprosy infection. **Keywords :** leprosy, chemoprophylaxis, contacts, randomised controlled trial.

Local Perceptions of Leprosy Control in Tamil Nadu, India

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Introduction : Despite achieving elimination of leprosy as a public health problem for the state of Tamil Nadu, questions remain about highly endemic areas, perceived trends and the quality of patient-centred care. While the professional literature considers epidemiological indicators with reference to targets, attention is also needed to consider local perceptions, a neglected aspect of leprosy control. **Methodology :** In-depth interviews were conducted with 4 experts and programme managers, 5 healthcare providers, 2 political (panchayat) leaders, and 6 leprosy patients. These interviews asked about respondents' views and experience of epidemiological trends, care of people with leprosy and the current status of leprosy control. **Results :** Programme managers uniformly acknowledged decreasing trends in prevalence, which they attributed mainly to operational factors rather than successful control. Patients seeking treatment for disabilities indicated their leprosy had not been previously detected. Healthcare providers indicated concerns about failure to detect disabilities early and inadequate access and acceptance of reconstructive surgery. **Conclusions :** Notwithstanding progress in leprosy control, the absence of active case finding results in some patients presenting for treatment only after development of disabilities. Strengthening the liaison between peripheral services and specialty interventions was an identified need to improve the quality of patient-centred care. **Keywords :** Leprosy control, disabilities; Case identification; quality of care.

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Introduction : Leprosy elimination was achieved in India in 2005; however, ground reality seems to be different. The utilization profile and the disease burden of patients, newly registering at a tertiary care centre, were studied in the context of elimination.

Methodology : A cross sectional study was done on 198 patients, of whom, 81 consented for assessment of utilization profile, activity and participation limitations, and mental health status. The P scale, SALSA and GHQ12 were tested as possible tools, for assessing non-economic burden. **Results :** Of 198 patients, 35 (17.7%) were newly diagnosed in our centre; of these, 71.4% were multibacillary. Average overall, patient and healthcare system related delays were 13.34, 7.9 and 5.44 months, respectively. 78.6% of patients presented themselves for "care after cure". 19.4% were forced to lose/change their jobs. Using the P scale, 8 (13.1%) patients had mild, and 2 (3.3%), moderate restriction of participation. The P scale correlated with mental health status and SALSA scores. Mean SALSA scores were 24.30 (± 6.26); scores increased with increasing disability. 50.9% were found to be depressed using the GHQ12, though specificity was only 54.5%, against ICD10 criteria. **Conclusion :** A continuum of care for 'after cure' issues, with continued emphasis on case detection is the need in this era of elimination. **Key Words :** Delay, P scale, SALSA

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WHO recently declared that Ethiopia has brought leprosy under control based on its standard that its prevalence rate since 2005 is below 1 per 10,000. However, we should look at factors which are peculiar to leprosy before we make such a conclusion. In this regard, I put forward two reasons : ➤ Even if treated and cured, the stigma and social exclusion of disabled leprosy patients is evidently more deep rooted and persistent than other disabled persons. ➤ The fact that even leprosy patients accept and believe the wrong perception forces them to isolate themselves from the society, compounding and affirming societal perception and stigma. As opposed to other western countries, which have managed economic prosperity, leprosy is prevalent and a major health problem in Latin American, African, and Asian countries. In my opinion, at least the following five basic public provisions should necessarily be improved before one conclude the disease is under control : Socio economic fulfillment · housing conditions · nutrition · Hygiene · Enhanced health education and improved awareness about leprosy I urge the WHO to re-think its decision that Leprosy is brought under control in Ethiopia because of two reasons : · A vaccination has so far not been developed for the disease · The magnitude of the problem will be beyond control if the disease developed resistance to MDT. I hope all those concerned with eradication of the disease from the face of the earth will try their level best to persuade WHO to re-consider the issue in more detail.

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Objectives : To study the model of Leprosy Control Program (LCP) for lower leprosy epidemic areas. **Methods :** A county with lower leprosy epidemic was selected to be a pilot area to study the model for 5 years. To think of local real situation of leprosy and the definition of strategy of Integration the LCP into General Health Services advocated by WHO in 1986, the measures of administrative intervention etc. were carried out to set up a network combined professional agency for LCP with general health services which include county level hospitals, township hospitals and village clinics respectively. Certainly, the feasibility of implementing the strategy had been expounded and proved in qualitative study in pilot area in the beginning of the research.

Results : The model have been come out by the study, namely, LCP of lower epidemic area should be supported by local government and depended on the measures of administrative and economical interventions to make the leprosy professional agency only to be the center for dealing with drafting local LCP plan, verifying diagnosis, training, supervising and evaluation etc. On the other hand, the general health services were made to undertake the duty of inspecting leprosy, managing people affected by leprosy (PAL), popularizing leprosy knowledge, near providing service for PALs with medical troubles and needs of rehabilitation. the function of the model has been showed aspects of pushing local government to pay more attention for LCP, improving medical stuff and the masses with the level of leprosy knowledge and precaution for leprosy, enhancing general health services in abilities of managing and recovering PALs, and making more disable PALs be offered near service on rehabilitation and so on. **Conclusions :** The model is feasible and can realize the sustainability of LCP in lower leprosy epidemic areas. Basic unit to carry out the model is on the county level. Support from local government is the key guarantee for running the model.

Key words : Leprosy Lower epidemic Model of Control Study.

Experience of a Community Health Project on Integration and Sustainability of Leprosy Programme

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Methodology of the Project : Krishna Community Health Interventions Programme (KRISCHIP), a direct project of LEPRA Society is working in the field of Leprosy and other allied diseases by involving the Community in Krishna district of Andhra Pradesh. The Project has worked in an integrated setup with the General Health System in implementing the Leprosy Programme. Also involved the community in the Health Programmes by forming the Health Forums, identifying the Volunteers and capacity building to the community groups in 580 villages and 130 slums reaching population is 15.6 lakhs. After completion of 3 years i.e. from April 2004 to March 2007 the impact of the Community Health Interventions through multi sectoral approach and a Project and Non Project area interventions has been analyzed. **Design/Methods Involvement :** The Project works with the Community, General Health Staff and local NGOs to increase awareness on the communicable diseases includes leprosy, tuberculosis, HIV/AIDS and malaria. Approach of the activities is complete involvement and capacity building of Community Groups, 1. Volunteers identified by the Project those who are interested in helping / serving the Community. 2. Forum members include the representation from all Govt. departments, Panchayaths, Religion and Community leaders. 3. Service providers like, Private Medical Practitioners, NGOs and General health Staff. The approach serves as a model for the design of care packages for vulnerable people as part of development of comprehensive care within the context of the health reform process. **Follow-ups and Reviews :** After the capacity building and sensitization formed Health Forums at the Village and Slums based as Surpanch / Corporator as chairpersons to the Forum which meets once in two months to discuss the health issues and regularity of the persons taking treatment for leprosy and other diseases. Also initiated a review method with the involved Volunteers and Forums in the form of "Participatory Community Reviews". **Conclusion :** The different approaches resulted in increasing the referrals; follow up of patients and continued participation in health awareness by the Community groups and other service providers. This involvement sustains the health programme by which community groups just pass on the health messages and guiding them to approach the concern health facilities for diagnosis and treatment instead of approaching the private facilities which affects their family economically and psychologically. Case Studies, Project and Non Project area interventions will be presented.

Free Papers - POD

O-189

Assessment of Prevention of Disability and Prevention of Worsening Disability Services at 9-Selected Townships in Mid-Myanmar

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A 5-year JICA leprosy Control and Basic Health Services Project (4/2000-3/2005) introduced POD/POWD service package at 9-selected townships in Mid-Myanmar in 2004. It consists of routine case assessment, self-care, footwear, ulcer care, reaction management, reconstructive surgery and referral system. Baseline case assessment was conducted between Oct 2003 and March 2004 and totally 10,528 RFT cases were registered and assessed their eye, hand and foot conditions by WHO disability grading. Result showed 35.1% was identified as WHO Grade II disability (7.1% in eye, 28.4% in hand and 25.8% in foot). Follow-up of these services from June 2005 for 18months showed among services introduced, reconstructive surgery and referral system were found not well done. Routine case assessment by the Impairment Summary Form (ISF) score has conducted since Aug 2005 almost every 6 months. By May 2007 assessment data was collected four times for clinical monitoring and more than 3,800 cases were assessed every time. Some data was found not reliable and not suitable for analysis because of misunderstanding of the method by field examiners. A smaller scale data (N=938) showed 10-20% of "Worsened" in three years even though services were available and also some impact of services (30% of "Improved").

O-190

Semmes Weinstein Monofilaments ; Sense and Sensibility

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In the need to detect early nerve function loss and to monitor the results of neuritis treatment, Semmes Weinstein monofilaments are widely used. What are the influences of age, use, moisture and temperature on the reliability of testing sensation with the Semmes Weinstein monofilaments?? Conclusions and recommendations are presented.

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Sustainable Self-Care for POD in North Malawi

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Introduction : Leprosy has been eliminated from Malawi but disability as a consequence of the disease continues to exist. Karonga Prevention Study (KPS) has recently reviewed the scale of this problem in Karonga District, to establish a sustainable care plan for treated leprosy patients and prevention of their disabilities (POD). **Methods :** Over 650 leprosy patients in Karonga district who had ever had a leprosy related disability recorded by KPS were followed-up through household visits by two leprosy control assistants (LCAs). Disabilities were assessed and care administered. **Results :** A total of 250 of the 650 patients were still alive and living within the district by February 2007. Of these, 150 were placed on a "care register", including 50 with current ulcers and/or a leprosy-associated secondary infection who were eligible for patient-initiated clinic-based active care, and 100 patients with other leprosy-attributable conditions (eg. dryness, anaesthesia, including people requiring protective clothing) - assigned to home-based self-care. About 25 patients required ophthalmic referrals, and a small number (<5) with severe difficulty walking required some further specialist advice. **Conclusion :** Disability from leprosy remains a care issue in Malawi despite its official elimination. Strategies to address issues of coverage of self-care and access to footwear have been identified as a key research priority in POD. Annual follow-up of leprosy patients will confirm whether this self-care strategy is effective and sustainable.

Further Developments that Contribute to Understanding of the Aetiology of Plantar Ulcers

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This study contributed evidence to support a general hypothesis that the kinematic function of the subtalar joint may be a predictor of plantar ulceration for people with insensible feet. Data relating to 144 people was used. Feet included in the study had normal skeletal structure (no bone loss) and no apparent loss of muscle function (intrinsic or extrinsic). Data related to 263 feet were used. 3 independent groups were analysed: "Normal" (no loss of plantar sensibility), "Insensible" (unable to detect pressure stimulus) and "Impaired Skin" (Insensibility and ulceration or scars from prior ulceration). F Scan technology (Tekscan Inc., Boston, MA) was used to gather salient kinetic data. Using a simple semantic classification, sub groups of feet were categorised as "Neutral", "Pronated", "Hyper Pronated" or "Supinated". It was found that where people presented with STJ positions other than "Neutral" higher forefoot peak pressures were recorded. The relative risk that ulceration would present on "Hyperpronated" or "Pronated" feet compared with "Neutral" feet was high (5.3 and 2.8 respectively) but "Supinated" feet were not at greater risk of presenting with ulcers than "Neutral" feet. Recognition of the position of the STJ during stance may help to identify people at risk of ulceration and may also serve as a guide to appropriate foot orthotic therapies. Interventions to prevent ulceration or ulcer recurrence should consider such factors.

Rapid Disability Appraisal Tool Kit Used Among People with Disability in South Sulawesi, Indonesia

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Introduction : The purpose of this study in South Sulawesi Province, Indonesia, was to test and validate a toolkit of instruments for Rapid Disability Appraisal (RDA). **Method :** We designed a toolkit of instruments to assess different aspects of disability, including only instruments compatible with the International Classification of Functioning (ICF). The RDA toolkit comprises 5 instruments (questionnaire on personal factors, child disability questionnaire, WHODAS-12, Participation Scale and perceived stigma scale). In-depth interviews and focus group discussions were also conducted with people with disability (PWD) and community members. **Results :** 331 PWD and 50 controls were included in the study. Most RDA interviews were completed in under 1 hour. Inter-interviewer reliability of the scales was good. Associations between personal factors and WHODAS, Participation Scale and stigma scale scores were as expected. Strong associations were also found between levels of activity, participation and stigma. Activity and participation were affected among 57% and 60% of PWD, respectively, without big differences between people with leprosy and PWD; 21% reported stigma. Qualitative analysis revealed a remarkable difference in the level of stigma against people affected by leprosy and people with other disability. **Conclusions :** ICF-based rapid disability appraisal is possible using the RDA toolkit. It is suitable for use with people affected by leprosy and with people with (other) disability. **Keywords :** disability, leprosy, rapid appraisal, ICF, disability measurement, stigma.

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A community-based Prevention of Impairment and Disability (POID) program was initiated in 2000 in 3 out of the 4 blocks that comprised the Gudiyatham Taluk, to provide home based care, educate patients on self care, identify and train members of the family /community as care givers and provided aids & appliances where appropriate. This program was not extended to block 4, after services were vertical services discontinued in 1997. The aim was to study the effectiveness of this community based POID (CBPOID) program in terms of the disability profile, activity limitation, participation restriction, the knowledge and impact of self-care, and use of appropriate footwear. The methodology used was to compare two groups of 120 patients in each group - 40 patients from each of the grades 0, 1 & 2 randomly selected - one group living in 1,2,3, blocks who were provided care through the CBPOID program and a comparison who were not provided care through the program. Patients were assessed using a standard disability assessment form, the SALSA and Participation Restriction questionnaire. The data is being analyzed for changes in WHO disability grade, EHF score, SALSA and PR score. The results will be reported.

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We have earlier reported on the disease burden caused by leprosy disabilities in Shahapur, a "taluka" situated about 100 km from the metropolis of Bombay (Ganapati et al 2007, Pai et al 2007). In the population of 2,78,524, a total of 286 patients with disabilities were identified by engaging rural volunteers working under trained supervisory staff. The area of Shahapur taluka was wide. We could not cover the entire population, some villages being located in inaccessible hilly terrains. As **Primary Health Centre (PHC)** is expected to play in future a crucial role in the management of leprosy in an integrated set up, we started an investigation focusing only on the population covered by four PHCs (out of nine) in Shahapur. We intensified the campaign of identification of disabilities. In the population of 1,49,000, covered by four PHCs alone, 294 (Grade II-246, Grade I-48) patients were unearthed. **Conclusion :** The intensive identification of disabilities in 4 PHC populations is far more than the crude figure reported for the "taluka" as a whole. Such a heavy load of leprosy disabled has not been reported in the literature and this calls for intensive training of PHC staff and appropriate management of patients.

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Majority of admissions in the temporary hospitalization ward or in the leprosy hospitals are for ulcers on the feet. It has been almost a decade since "Self-care Kit" was introduced by NCLCA as key modality for healing the wounds and ulcers at home. NCLCA's "Self-care Kit" is a zippered bag containing antiseptic liquid, foot scraper, antibiotic ointment, a moisturizing cream, sterilized gauze, scissors, bandages and an adhesive tape. Step-wise empowerment training is given in the use of the self-care kit at as "Group Therapy" session, which consists of use of the kit at home. Finally, patients are given the MCR footwear wherever indicated. At the field level, coming together of patients with different skin conditions and deformities at a group therapy session also act as motivating factor for practice of the self-care. Follow-ups show that after achieving cure or visualizing the good result by the use of the Self-care kit, the patients feel more in control of their disabilities. Cost is low especially when compared to the amount that a patient has to spend to reach the hospital daily for dressings. The cost to service provider is also low when compared with admissions. In essence, the field area approach adopted for management of disabilities in feet with "self-care kit" is a simple and pragmatic solution for the vexatious problem of ulcers and wounds in leprosy. Presented at the SEARO Conference at Myanmar in 1999, it has been adopted and replicated by government and NGOs alike with locally available materials. However, its adoption is needed at still wider scale for empowering patients in prevention of disabilities.

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Leprosy may lead to great disability through nerve damage and its consequences. Osteoporotic fractures may cause potentially-avoidable extra suffering and further disability in leprosy-disabled individuals who have an unfortunate combination of risk factors. Patients suffering various complications of leprosy are managed at DBLM hospital in Northern Bangladesh. Amongst patients admitted over the past 4 years we identified at least 8 who had suffered osteoporotic fractures of vertebra or femur, and considered the risk factors in each case. We reviewed management for these cases with a view to making recommendations to reduce the incidence of such fractures. Sample case histories will be presented. Several patients had multiple risk factors, including long term steroid treatment, prolonged immobility and malnutrition. Even in those who complained of bone pain, some fractures were not promptly diagnosed. Staff are now more alert for this type of case. For avoiding additional disability, the risks associated with osteoporosis needs to receive adequate attention. Measures to prevent falls as well as methods to improve bone density are important. **Key words** : osteoporosis, leprosy-affected people, disability, prevention.

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Introduction : Multibacillary leprosy is a common cause of nose deformities. Nasal lining can be severely injured by direct mycobacterial action. The surgical techniques used to reconstruct the nose must include some form of providing new nasal lining. In this work, a case is presented in which the lining was reconstructed with vascularized oral mucosa. **Methodology** : An adult male patient with treated lepromatous leprosy and typical nose deformity underwent a two-stage nasal reconstruction. In the first stage, nasal lining was reconstructed with a facial artery myo-mucosal (FAMM) flap, taken from the left side of the oral cavity. **Result** : Healing proceeded uneventfully, providing new lining to the nasal cavity. **Conclusions** : The FAMM flap is a valid novel alternative to reconstruct, with vascularized mucosa, the destroyed nasal lining in leprosy. **Keywords**: Leprosy. Nose deformities, acquired. Rhinoplasty.

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Introduction : To assess the long-term results of nerve muscle grafting for promoting sensory recovery in leprosy. **Methods** : Thirty-eight leprosy patients with localised irreversible nerve damage, 11 median at the wrist and 37 posterior tibial at the ankle were repaired using freeze-thawed skeletal muscle autografts ranging from 2.5cm. to 14 cm. lengths to promote sensory recovery. Detailed 6-monthly sensory motor assessments were performed. Questionnaires were used to assess quality of life and hand and foot function. **Results** : Sensory recovery was noted in 34 out of 38 patients and maintained throughout follow-up periods up to 14-years. Following median nerve repairs all patients remained free of ulcers and blisters, 10 out of 11 demonstrating texture perception and 8 out of 11 weighted pins. In the posterior tibial nerve repair group 24 out of 30 showed improved healing of ulcers and texture discrimination in 26 out of 30 repairs. The quality of life and hand and foot questionnaires showed improvement, daily living response was improved 80% after hand operation and 60% after foot operation. **Conclusion** : This study demonstrates that nerve muscle grafting results in improved ulcer healing and textural recognition; with high patient satisfaction levels. **Key Words** : Denatured muscle autografts – leprosy nerve damage – sensory recovery – ulcer healing.

O-200

A Literature Evaluation of the Potential of Surgical Nerve Decompression to Reduce Impairment and Disability in Hansens Disease Neuritis

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Recent onset leprosy neuritis has been effectively treated both by prednisolone and surgical nerve decompression. Both treatments are known to be most effective when used within 3 to 6 months of onset of impairment. There are however limitations to the effectiveness of steroid treatment with significant failure rates of 25-50%, and in some patients steroids cannot be used. Nerve decompression treatments also have significant failure rates. In practice surgery has often been used in last resort fashion when medical treatment for a number of months has failed. Attempts to define best sequencing, surgical techniques, and patient selection have never been settled with strong scientific studies. Expert opinion on when operation is indicated runs the gamut from very early to never, ever. Two reports on a single patient group are widely understood as having settled the issue by showing no additional benefit to surgery in comparison to steroid treatment alone. The significant weaknesses in design and execution of these Pannikar and Ebenezer studies are examined in detail. The small randomized prospective study of Boucher suggests that in some parameters combined surgery and steroid protocols are superior to steroid alone. A collation of indications for nerve decompression based upon expert opinion of several authors is presented. The various opinions of who should be operated, when surgery should be offered, and how nerve decompression, should be done are discussed. A growing body of literature supporting the use of nerve decompression for pain relief and prevention of complications in diabetic neuropathies is reviewed which likely has relevance in Hansens disease. Several studies are identified which give optimism that improvement may even be achieved in more chronic and longstanding leprosy neuritis impairments. A protocol is suggested which would sequence steroid use and nerve decompression dependant upon rapidity and degree of patient response, the occurrence of relapses, and residual pain levels. This should produce strong scientific evidence which can guide future decision making and achieve best patient outcomes minimizing residual impairment, pain, and disability.

O-201

Towards Restoring the Function Faster After Corrective Hand Surgery

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The conventional plan for restoring function includes surgical correction, immobilization in plaster cast, suture removal and post-operative physiotherapy. It takes on an average 7 weeks from the day of operation in a fully mobile uncomplicated claw hand. Of these 3 weeks are for immobilization and rest for physiotherapy. Some reports are available about early mobilization after tendon repairs but reports on early mobilization after tendon transfers are scanty more so in leprosy. The emphases in these reports are either on the final outcomes or on comparatives with convention protocols. The details about mobilization and exercise programs have not been given in detail. The present paper describes the protocol for some popular procedures for claw finger correction and opponensplasties, for early mobilization and physiotherapy.

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Post-Operative Follow-up of Foot Drop Patients a Retrospective Study

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Introduction : Foot drop, a known complication of leprosy, cause altered gait, uneven pressure and plantar ulcers. A retrospective study was undertaken in Sacred Heart Leprosy Centre, Sakkottai, South India, to assess the results of Tibialis Posterior tendon transfer (TPT2T) to correct foot drop. **Method :** 200 patients who underwent TPT2T were included. All patients had adequate pre and post-operative physiotherapy. The surgical procedure is the standard (i.e.) disinsertion of Tibialis Posterior Tendon, brought out at leg , divided into 2 slips, tunnelled circumtibially to dorsum, sutured to EHL and EDL tendons. Post-operative range of movement from active plantar flexion to active dorsiflexion was taken as improvement achieved. **Results :** Total n = 200 patients (Males 178, Females 22): Age in years 10 - 25 = 41 (20.5%) s in years in years : 1 - 5 = 159 (79.5%) 6 - 10 = 31 (15.5%) > 10 = 10 (5 %) Follow-up period in years: 2 - 10 = 89 11 - 20 = 63 21 - 30 = 48 Improvement observed: Nil range = 5 (2.5%) Poor Upto 10 degrees = 56 (28%) Fair 11-25 degrees = 84 (42%) Good > 25 degrees = 55 (27.5%) Excellent **Discussion :** Surgery restored gait in majority - In 30 patients who had ulcer - recurrence was less after surgery. - In severely deformed foot, surgery helped to fit PTB. **Conclusion :** Foot drop correction is a mandatory component in leprosy care. **Key Words :** Foot drop, Tendon transfer surgery, Dorsiflexion, Range of movement.

Feasibility of Conducting Reconstructive Surgery in Integrated Approach – An Experience in Orissa

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Introduction : Leprosy leads to disability which continues as a life long problem, if not treated early. Through Reconstructive Surgery (RCS) some of the disabilities can be corrected and the lost form and functions are restored. LEPRASociety is extending RCS facilities in Orissa since 1994 in a vertical set up. To sustain the programme in the mainstream, this Society as ILEP coordinator for the state has started facilitating these services from 2006 in various pioneer leprosy institutions, medical colleges & NGO hospitals of the state. This paper aims to present the experience of re-constructive surgeries undertaken from January 2006 to August 2007 in an integrated approach in Orissa. **Methodology :** It was piloted in 6 institutions and found 3 promising institutions to continue the same in ensuing years. The programme implementation is in line with DPMR plan announced by Gol (yet to be launched). As mentioned in the project plan all suitable cases were referred by the concerned health workers through proper channel after imparting required training for various categories. All the post operative cases are subjected for follow-up till 5 years. **Results :** The details of corrections are given in the following table.

Type of correction	Male			Female			Grand total
	Rt.	Lt.	Total	Rt.	Lt.		Total
Ulnar claw	52	29	81	15	15	30	111
Opponense	09	08	17	03	03	06	23
Foot drop	39	16	55	10	04	14	69
Lagophthalmos	02	07	09	02	03	05	14
Total	102	60	162	30	25	55	217

Among the 198 cases operated, the male population is 153 (75%) and the rest 45 (25%) is female. Age ranged from 13-52. Of the 217 surgeries conducted, 134 (61.7%) were on upper limb, 69 (31.8%) on lower limbs and the rest 14 (6.5%) on eyes. As mentioned in many references, ulnar was the commonest nerve affected since 51.1% ulnar clawing corrections were performed amongst the total. Dominance of right side deformity correction is observed in 60.8% when compared to left 39.2% which is 1.5 times higher. The initial follow-up results reveal satisfactory results in about 80%. **Conclusions :** RCS can also be done in integrated system. Ulnar clawing stands as the most common deformity requires RCS. **Key words :** RCS, ILEP, DPMR, Upper limbs, Lower limbs, Ulnar clawing, deformity.

Reconstructive Surgery of the Foot in Leprosy

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Reconstructive procedures of the limbs in leprosy were originally envisaged as tendon transfer procedures of the hands and feet and soft tissue reconstructive procedures and bone grafts of the hands and feet. However over the last 20 to 25 years, there is a perceptible trend to classify only tendon transfers as reconstructive surgical procedures of the limbs. This paper seeks to explore the various options available for reconstruction and salvage of disintegrating feet in leprosy apart from the procedures for foot drop correction and claw toe correction. An attempt is made to look again at these procedures such as arthrodesis, cutaneous flaps, neurovascular flaps and osteo-cutaneous flaps and reintroduce them into the armamentarium of the reconstructive surgeon working in the field of leprosy. It is concluded that these options should be considered before the foot is condemned to an amputation, and recommended that training in reconstructive surgery should also include experience and orientation in this method of thinking. **Keywords :** reconstructive surgery of foot, reconstructive surgery in leprosy.

O-205

Factors Affecting Success of FDS (Flexor Digitorum Superficialis) Transfer to Replace Opposition of the Thumb

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Introduction : Loss of opposition of thumb complicates the hand coordination of the patient with median nerve paralysis. Opposition can be replaced by Opponens replacement (Ring finger FDS procedure or EIP transfer) and also restore the appearance of the thumb. However there are several factors, which affect the success of the procedure. **Results :** In this paper, amount of opposition level increased and improvement in grasp contact, pinch contact and muscle power after FDS transfer are described and correlated with specific patient factors based on leprosy patients who underwent FDS transfer during 1998-2006. About 100 patients were studied, all with Ulnar and Median paralysis and assessment was made 6 weeks after surgery. **Key words :** FDS transfer, thumb opposition.

O-206

Medial Planter Artery Flaps In Heel Ulcers - Outcomes and Patient Satisfaction

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Heel ulcers are one of the major causes of amputations in leprosy patients with anesthetic feet. Conservative management with rest and Plaster of Paris has limited benefits with high rate of re-ulcerations. We have used medial planter artery flap for heel ulcer coverage in 22 patients with 1 flap necrosis and 1 re-ulceration. All the 20 patients are very satisfied and ulcer free at 1 year follow-up. **Key words :** heel ulcer, medial planter artery flaps.

O-207

Restoration of Opposition of the Thumb by Extensor Digiti Minimi Transfer in a Case of Partial High Median Paralysis

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For correction of considerable severe Partial High Median Paralysis (usually combined with Partial Radial Paralysis and Ulnar Paralysis) directive publications are rare (Fritsch (1984) and Srinivasan H (1978) and in such cases of partial High Median Paralysis the number of motor tendons available for successful transfer is considerably if not extremely reduced. In one such case who had undergone already Abductor Pollicis Longus Deviation Graft Operation modified for stabilize CMC and MCP joints of "intrinsic minus" thumb (Beine A (2005) we did an innovative surgical procedures using extensor digiti minimi for opponens replacement, which worked combined with the earlier done procedure extremely well, restoring opposition of the thumb.

O-208**A Clinical, Histopathological, and Immunohistochemical Evaluation of Sensorial Impairment Recovery and Nerve Regeneration in Leprosy Cutaneous Lesions**AC Castra, Magalhaes GO, Rangel E, Illarramendi X and Antunes SL

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Recovery of sensorial impairment (SI) of leprosy cutaneous lesions, assessed by sthesiometric tests, and nerve regeneration, evaluated via immunohistochemical labeling of PGP9.5 and NGFr neural markers after MDT, were correlated with DNDI, a histopathological dermal nerve damage index, in 35 leprosy patients. **Results** : Thermal and pain sensations were the most frequently affected neural functions. Tactile sensation was the least recovered after MDT. No correlation was found between SI and DNDI. However, epithelioid granuloma in the infiltrates correlated positively with the presence of thermal sensation impairment and lower recovery levels after MDT. The dermal occupation rate by PGP- and NGFr-immunolabeled nerve fibers in the 1st and 2nd biopsies taken from a restricted group of 11 patients were not significantly different, suggesting that the basic recovery process is not a regenerative one. These study results indicate that MDT has a varied albeit indirect influence in the recovery of sensorial impairment.

O-209**Can Government Health Workers Implement Prevention of Disability Measures Effectively : An Assessment of a Prevention of Disability Project in Selected Counties of Guizhou Province, Peoples' Republic of China**Jin-Lan Li¹, Li-Mei Shen¹, Hong-Jiang Mu¹, Xia Bao¹, Wei Ke¹, Ying Wang¹ and Hugh Cross²¹Institute of Dermatology, Guizhou Provincial Center of Disease Control and Prevention, P.R China and Dr. Hugh Cross, ²American Leprosy Missions

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Objective : To understand the influence and effect of prevention of disability (POD) for people affected by leprosy in 9 counties of Guizhou Province, Peoples Republic of China. **Methods** : According to the principles and national criteria of the NCLC, POD Pilot program, 1 215 people affected by leprosy were selected, followed up and assessed with the use of disability record forms through which essential indicators were regularly observed. **Result** : Most improvements of disabilities occurred in the 1st year of the POD project. 55 neuritis cases were detected and treated with prednisolone out of 262 new or active cases, 47 of these improved. Self-care program was instituted among 1 130 people who completed a 3 year program. 88.5% of red eyes, 83.9% of hand ulcers and 62.8% of simple foot ulcer cases were healed. 196 people who presented with complicated ulcers were treated, of them, 73 (37.2%) people reported with healed ulcers. **Conclusion** : The POD project was a cost-effective method to prevent further disability occurrence among people affected by leprosy. Most of people affected by leprosy were satisfied that their disability improvement had been due to self-care. The program had helped them to increase their confidence to implement self-care activities and to reintegrate them socially. More specific professional trainings should be provided for public health workers for the implementation of further projects. **Key words** : Leprosy; Disability; Prevention.

O-210**Anatomical and Functional Outcome of Opponens Transfer of Hand in Leprosy**

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Introduction : The purpose of the study is to measure the anatomical and functional outcomes outcome of opponens transfer in leprosy. **Methodology** : All patients who underwent opponens transfer over the period 1995 - 2001 were selected for the study. Charts were retrospectively analyzed and patients were called for assessment according to Sundarraj's evaluation criteria and also functional assessment of hand like pinch strength, grip strength and fine manipulation were measured. 56 patients were included in the study. **Results and Conclusions** : According to Sundarraj's criteria, 76.6% had excellent or good results, 13.3% had fair results and 10% had poor results. There was statistically significant improvement of pinch strength, grip strength and fine manipulation between excellent/good and fair/poor and also between preoperative and postoperative. Age and duration of paralysis had statistically significant influence on the outcome of surgery. **Key words** : Surgical correction, Opponens transfer, Pinch strength, Grip strength and fine manipulation.

Prospective Assessment of Disability, Surgery and Quality of Life : Design, Methodology and Intake Findings of the PASQUAL Study

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Introduction : Leprosy is a disabling disease. The present study was set up to assess the perception of disabled people about their daily functioning and social participation and how reconstructive surgery might improve this. **Methods :** PASQUAL is designed as a follow-up study of people with disability. People who are willing to undergo surgery will be included in the intervention group. People who do not undergo surgery will be included in the referent group. This study in northwest Bangladesh aims to include 250 people, aged between 15-60 years, affected by leprosy with nerve function impairments of hands or feet which can be corrected by tendon transfer (claw hand, ape thumb, foot drop). The assessment consist of a participant details form, the SALSA, P-Scale and SRQ-20. The SALSA measures activity limitations and safety awareness, the P-Scale estimates participation restrictions, and the SRQ-20 screens for mental disorders. Patient expectations and satisfaction of surgery will be recorded for the surgery group. Follow-up assessments will be done after one year, and possibly after two and three years. The main outcome measure is difference in 'quality of life' scores over time and between groups. **Results :** We will present and discuss intake findings. **Conclusions :** This is the first study aiming to evaluate the impact of reconstructive surgery on functioning and quality of life in persons affected by leprosy. **Keywords :** leprosy, disability, surgery, quality of life.

Volunteer Training of Trainers in SC / POD

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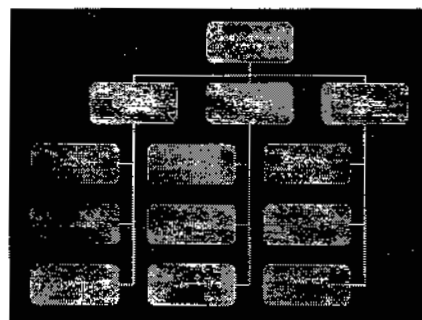
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Aims : Volunteer Training of Trainers and PAL's in SC/POD. **Objectives :** The objective was to train the trainers with sufficient knowledge of self care and POD so as to enable them to further train other volunteers and PAL's in Self care and POD. It is expected that these volunteers will, in turn teach other volunteers self care and POD and this process goes on. Highlight self reporting for leprosy diagnosis. Creation of Self Care groups. Target Audience 1) PAL's 2. Grass root volunteers working in the field of Leprosy. 3. Volunteers of Bharat Scouts and Guides who are working in the field of Leprosy. 4. Loakdoots. 5. Any other NGO working in the field of Leprosy.

Details : One of the main aims was to teach all those who attended this workshop, practical working details of self care and POD. These would be the first level of trainers. These trainers will then teach other people in the community, volunteers, and people working with PAL's, or Leprosy patients what they have learned at this workshop about SC and POD so that they in turn become 2nd level of trainers. These 2nd level trainers then teach 3rd level of trainers and the process has a domino effect and by this way a vast number of people who have working knowledge of leprosy SC and POD is created. This takes place at the grass root level and there is horizontal and downward spread of knowledge. Workshops thus conducted will train far more number of trainers than those Who actually attend the workshop. The workshop teaches trainers to train others to become trainers including Loakdoots (an Indian term for cured patients spreading the word of Leprosy cure coined by Dr S D .Gokhale...) the following diagram illustrates this. The SC and POD activities that are taught include cases of hand, feet, eyes, skin etc which are discussed in depth, queries addressed, and practical tips given. The participants are given a good working knowledge about the same and problem solving in SC/POD is discussed. Along with these participants are taught how to start self care groups in the community and to teach others how to start self care groups. The limitations of such groups and SC/POD activities are also highlighted. **Results :** So far up to 2 levels of TOT knowledge spread workshops have been held, i.e. 1st level of trainers were taught and they in turn taught 2nd level of trainers and they in turn taught 3rd level of trainers. Hence the total number of people trained was far far more than the number which attended first training. **Conclusions :**

This type of model is effective in rapid dissemination of knowledge of SC POD in high endemic areas at a far lower cost.

Keywords : Self care, POD, Trainers



Disability Status in MB Leprosy Patients After Release from Treatment (RFT) in South India

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Introduction : Leprosy prevalence has come down to elimination stage i.e less than 1 per 10,000 during post-MDT era. Public health administrators felt that in addition to identification of cases through integrated surveillance system, management and rehabilitation of disabled patients is necessary. The literature on development of disabilities in MB patients after RFT is scarce. Hence, this study is carried out. **Objective :** To assess the disability status after RFT during 5 to 15 years of follow up. **Methodology :** Experienced leprosy field investigators from NIE blinded for earlier status examined all the patients for current disability. (Disability status was assessed based on WHO guidelines 1980). The information on disability was collected for 370 patients. But the information at three points of time from RFT was available only for 87 patients during 5 – 15 years of follow up. The disability status from one state to the other during the follow up was assessed. **Results :** a. Out of 15 patients with no disability at RFT, 14 (93.3%) remained with no disability. b. Out of 28 patients with grade I disability at the time of RFT, 8 (28.6%) have progressed to grade II, while only one patient progressed to grade III. 6 (21.4%) patients remained static (grade I disability), while 13 (46.4%) have improved from grade I to normal. No patient has improved from grade II to normal. c. 14 (51.9%) out of 27 patients have progressed from grade II to grade III disability. 12 (44.4%) out of 27 patients remained in the grade II status. Only one patient has improved from grade II to grade I. Out of 17 patients with grade III disability at RFT, 16 (94.1%) remained at the same status. Only one has shown improvement (grade II disability). These results indicate that misclassification error in assigning the disability grading is minimal.

A Follow Up Study of Recurrent Planter Ulcers in Leprosy in Kolkata

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Introduction : Chronic heel ulcers are frequently seen problems in anesthetic feet in leprosy. Many flaps have been described in the management of small defects of the heel. These range from simple local flaps to micro vascular free flaps. **Methods:** In Premananda Memorial Leprosy Hospital, in the course of seven years (between January 2000 and December 2006) we have seen a total of 245 heel ulcers in anesthetic feet due to leprosy. 162 surgeries were performed on 129 cases. Procedures included calcaneal paring alone (8 cases), local rotation flap (51 cases), medial plantar artery island flap (49 cases), cross thigh flap (14 cases), and reversed sural artery flap (6 cases) as the first procedure. **Results :** 32 cases underwent more than one surgery. The duration of ulcers prior to the surgery ranged from 1 month to 15 years. The follow-up period ranged from 1 month to 4 years. Healing time after the surgery ranged between 16 and 45 days. Complications seen, included wound infection (9 cases), haematoma formation (2 cases), recurrence of a sinus (21 cases), partial flap necrosis (10 cases) and eczema of the flap (6 cases). Recurrence was seen in local rotation flaps (10 cases) and in reversed sural artery flaps and cross thigh flaps (11 cases). Recurrence was not a problem with medial plantar artery island flaps. **Key words :** planter ulcers, ulcers in leprosy, follow up of ulcers.

Disability Assessment of The Newly Diagnosed Leprosy Cases in Uttar Pradesh, India

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Introduction : In the Post Elimination Era Disability Prevention & Medical Rehabilitation gains greater importance. However, information on Disability Burden is not easily available except in small projects. This study presents the analysis of 1805 new cases assessed from all the 70 districts in the State. **Methodology :** Case validations using a Standard Proforma are carried out by District Technical Support Teams along with the District Nucleus staff. New cases registered within one to three months were assessed for their Disability Status both Grade-I and Grade-II. Currently data on Grade-I is not collected and Grade-II is found to be only 1% which is way below the National average of 6%. The data collected for 3 months is analysed.

Results :

New cases assessed	1805	
Grade-I Disabilities	152	8.4%
Grade-II Deformities	82	4.5%

Conclusion : The analysis revealed that Grade-I disabilities could be 8 to 9%. Secondly Grade-II deformity rates of 1% is an under-estimate, thus, emphasizing the need to train the health staff in Proper Disability Assessments.

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Prevention Of Disability (POD) in National Leprosy Eradication Programme (India) is limited to POD camps once a year. Systematic activities are implemented in Nellore district in India by collaborative efforts from district leprosy office and NGO. Health workers and Person Living With Leprosy-related Disability (PLWLD) are trained in self-care practices in 14 out of 61 PHC in Oct 2005. A team of Para-medical staff and physiotherapy technician with experience in POD visited health sub-centres once a quarter and provided on-the-job-guidance to health workers in supervision of PLWLD. The progress is monitored by the team using a checklist once a quarter. PLWLD practicing self-care has been maintained at around 71% and 78.6% of health workers are supervising PLWLD. Plantar ulcer healed in 61/138 (44.2%). MCR footwear (280 pairs) has been distributed to the needy. Continuous supervision and support resulted in sustainable POD activities in an integrated set-up. **Key words :** POD, self-care, integrated, leprosy.

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Introduction : A study was carried out in Grade I & II disability, Neuritis and Reaction cases. The study was centered around males- mean age -52 and females-mean age -44 years. The class in focus – maximum in labour class (50%), B.P.L. (75%), uneducated class (68%)with no primary education. {Table-1} Aim of the study was to impart knowledge of self- care; to provide protective aids; to motivate individuals for RCS / other surgery. **Methodology :** Data was collected from April 1997- March 2007 disability cards / reaction and neuritis cards of individuals. Briefly stating, Grade I -267 cases; Grade II -17 cases ; Neuritis-325 cases ; Reaction- 437 cases {Table – II} Personal periodic intervention was carried out. Group intervention and family counseling were some of the hallmarks of our intensive work in this field. A monthly follow up of individual cases was carried out systematically by medical officers, leprosy and health workers. Interventions given to afore-mentioned individuals were as follows- Health education : An early introduction of self- care practices HOPE,POD CAMPS, wound dressing, nasal toileting, splints, grip-aids, decompression surgery/ RCS/ Medical management and other required protective gears. **Observations :** Outcome of these intensive measures were amazing and rewarding. In Grade I cases of 267 cases, 51-worsened (development of ulcers), 54 cases were static, whereas, 162 cases showed marked improvement. In Grade II, 10 mobile case out of 17, through RCS, at the district level camps, by orthopedic/plastic/eye surgeons, were almost normalized and they could easily continue with their normal routine. In Grade II, out of 07 fixed deformity cases, 06 showed no change i.e. without cracks, fissures, ulcers. One showed of partial mobility by 10 degrees i.e. without cracks, fissures, ulcers. In neuritis cases, out of 325 cases, early detection and medical/ surgical management led to a phenomenal improvement in 324 cases. Only 01 case, five years after decompression were managed medically, Only one case so far was referred to Mission Hospital, Naini (U.P.) due to repeated bouts. {Table- III} **Conclusions :** 1. Early interventions in Grade I disability, by self – care practices HOPE,POD CAMPS and counseling has helped to prevent further disability by 80% 2. In Grade II disability cases it was observed that secondary complications do not occur. 3. Early and good management (Medical/ Surgical) of neuritis and reaction cases has brought about a considerable reduction in risk of disability. 4. However , the economic, social conditions of individuals, their work atmosphere, their level of education, standards of living are potent, resistant factors which retard the progress of work and integrated efforts on part of the health personnel. These underlined factors are directly and indirectly responsible for increase in disabilities.

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LEPRA Society started the leprosy project in Malkanagiri in 1992. POD and POWD services have been extended to all the cases as per the requirement. This paper presents the changes in disability status (both improvement and worsening) after appropriate interventions among the disability cases. **Methodology** : Since inception till December, 2005 the project has registered 3,771 cases for treatment of leprosy. All have been cured with MDT. Among them 674 (17.9%) cases were found to have disabilities; 310 (46%) Gr. I, 364 (54%) Gr. II at the time of registration. All were under chemo & physiotherapy depending upon the duration of onset of disability & clinical condition. **Results** : Among 674 disability cases, 49 (7.3%) improved, 17 (2.5%) worsened and the others remained static. The status of 18 was improved by RFT while the rest 31 took more time. 20 (40.8%) cases received steroids while the other 29 (59.2%) improved without steroids. Initial Disability status Subsequent disability status Total Gr-2 Gr-1 No disability Gr-2 0 3 3 6 Gr-1 17 0 43 60 Total 17 3 46 66 8 (47%) cases worsened by RFT while the rest 9 (53%) progressively worsened. 8 cases developed motor paralysis has developed motor paralysis and other 9 developed ulcers. **Conclusions** : The progression of disability in 674 cases of leprosy registered during 1992-2005 is noted and presented. **Key words** : Disability grade, Impairment, Paralysis.

Dehabilitated Life of Disabled People Affected by Leprosy Among Leprosy Colonies in Kathmandu Valley, Nepal

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Introduction : There is a need to determine the profile and quality of life among disabled people who live in Leprosy colonies in Kathmandu valley. Data was collected on a random sample of 61 persons using a questionnaire. Average age of respondents was 49.4 years and 57.4% were illiterate; Most of the people in the colonies belonged to Chhetri and Tamang ethnic groups. The average number of members in a household is 2.97. Majority were single. Average severity of disability (EHF) was 6.67. 93.3% of them did not know that 'Leprosy is curable'. 75.4% were farmers. 60.6 % of Farmer grew grain that was enough for 7.7 months for own consumption. Only 46% had domestic animal for milk and meat products. 95.4 % had own house but had poor house environment. 75.4 % of the respondents were losing their income because of physical disability, social stigma and lack of jobs. It is concluded that leprosy affected people in the colonies are in need of socio-economic rehabilitation for their economic growth and participation in the main stream of normal community. **Key words** : debilitation in leprosy, debilitated life, debilitation in leprosy colonies.

Factors Influencing Development of Planter Ulcers Among Leprosy Affected Person of Nepal

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Planter ulcer is one of common problem in leprosy which leads many further damages of the foot. There are many leprosy patients having planter ulcer even though they have been treat with different intervention to reduce planter ulcer. The main aim of this study is to find out key reasons of getting planter ulcer which will help to introduce appropriate method to reduce the planter ulcer. This study will not cover the actual situation of their living places. This study will be descriptive and prospective. About 100 leprosy affected person with planter ulcer attended in Anandaban hospital will be taken as for the study with 1/3 female patient. Method will be direct interview with patient with using standard questionnaire form. Finding data's will be analyzed with using EPI6 in the computer based programme. Results and findings of the study will be discussed at presentation. **Key words** : factors in planter ulcers, planter ulcers in leprosy.

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A Study on the Trained Poor Artisans with Leprosy and Disability : Towards Sustainable Livelihood by Skill Enhancement

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Introduction : The study emphasizes that skill enhanced artisans with disability and leprosy in Bankura (West Bengal), Champa (Chattisgarh) & Vadathorasalur (Tamil Nadu) have sustainable livelihood through economic development **Methods :** The methodology adopted under this study is "the Social Sciences Research Method". Data was collected from all the beneficiaries from all the above three areas was assessed. **Results :** 50 % and more trained artisans have enhanced their income to minimum wages level. Nearly 50% of them have gainful employment (more than minimum wages). 70% and more have reported skill enhancement in their craft trade and enhancement in their livelihood. **Conclusion :** The Study has revealed that the trained artisans with disabilities (who have orthopedic handicaps and disability percentage less than 50%) have gained employment opportunities. There is a sustained livelihood for the trained artisans linked with local resources, needs and demands. **Key words :** disability, leprosy in artisans, training.

O-222

Acceptability and Effectiveness of HDPE Prosthesis Among Leprosy Patients Amputated Below or Above the Knee

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Persons with amputated lower limbs require suitable prosthesis to restore near-normal function related to mobility and locomotion. The major difficulty of below-knee or above knee prosthesis relates to the ability to provide flexion at the knee to enable squatting or sitting cross-legged, a position most frequently adopted in developing countries such as India. A low-cost, light prosthesis was developed at TLM Hospital in Purulia, which was tested for acceptability and technical qualities. An interview guide was used to assess satisfaction and problems faced by the person. Observations were made on the locomotion, sitting and squatting position in terms of difficulties, effectiveness and smoothness in operation of the device while fitting and walking. Adaptability to various domestic and working environments were also examined. Technical and other engineering aspects for further improvements were noted. A total of 29 persons were studied, who were fitted with the prosthesis and used for at least 3 months. The device seemed to provide a reasonable degree of satisfaction in locomotion or squatting/sitting on the floor for the patient. It also appears to fulfil the professional standards of safety and durability, etc. **Key words :** HDPE prosthesis, prosthesis in knee amputations.

O-223

A Trial on Trophic Ulcers Using Homeopathic Medicine — A Clinical and Histopathological Evaluation

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Hansen's still remains as an enigma not only because of its continued transmission and rise in new case detection rate but also because of the occurrence of deformities in a great proportion of patients. Although MDT regimen has been effective in killing *M. leprae* resulting in cure of leprosy patient from infection but it has no impact in the occurrence of trophic ulcer. In the present study a double blind clinical trial in homeopathic system was undertaken on MDT cured patients suffering from trophic ulcer. 107 patients with trophic ulcer were selected for this study. 87 patients in the study group were given orally Mercurius Sol, once in a week, for a period of two years and 20 patients of the control group received placebo. Among the patients of study group, 21 showed complete regain of touch and pressure sensation. 23, 18, 14, 7 and 4 patients showed >80%, >60%, >40%, >20% and <20% regain in sensation respectively. Control group did not show any significant change. Histopathology before onset of treatment revealed hyperkeratosis, collagenous oedema of the dermal layer. Nerve bundles were found to be swollen, oedematous, infiltrated with lymphocytes. Nerve fibres showed degenerative changes. In few cases perineural accumulation with plasma cell, foamy macrophages and lymphocytes was noticed in the dermis. Focal perivascular lymphocyte collection was also seen. Sweat glands were atrophic and pilo-sebaceous glands were absent. At the end of the treatment histopathology showed almost normal dermis containing normal looking nerve twigs and few sweat glands. Blood vessels appeared normal. Perivascular and perineural inflammations were absent. Due to regain of sensation patient could take care of their hands and feet which resulted in marked reduction in the size of ulcer. Therefore, the above therapy was found to be most suitable for cure of trophic ulcer. **Key Words:** Trophic ulcer, Homeopathic medicine, clinical trial.

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A Randomised Controlled Trial of Honey Versus Saline Dressings in The Treatment of Plantar Ulcers Secondary to Leprosy

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Neuropathic plantar ulceration is a significant cause of disability and stigma in leprosy. At our own hospital setting (Anandaban Hospital, Nepal) ulcers account for 56% of our total bed days. Our average length of admission for patients with plantar ulcers is 45 days. The main dressing used in Anandaban is saline-soaked gauze. Betadine is also sometimes used for very dirty wounds and acetic acid for suspected pseudomonas infection. Our nursing staffs have also used honey as a dressing for a number of years and so are familiar with its clinical use. Antibiotics are only prescribed where clinically indicated (evidence of spreading infection) and we do not routinely swab ulcers for culture and sensitivity. Septic surgery is regularly performed to debride ulcers as indicated and we make frequent use of plaster of Paris casts, with a window to allow ulcer dressing. Honey has been used in wound dressings for many centuries. A number of recent wound care studies have compared the use of honey-soaked dressings with other topical products. However, we have not found another study where honey was used in leprosy related ulceration. We believe that this study will give important information as to the efficacy or otherwise of honey in wound care as we hope to recruit a relatively large number of patients, in a controlled (in-patient) environment. The other advantage of this study is that the wounds studied will be of identical etiology.

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Importance of Bio-Mechanical Assessment of Foot and Orthoses in Ulcer Management

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Hyderabad leprosy project covered a population of 2.1 million and registered 1418 patients with deformities due to leprosy during last 15 years. Plantar ulcers constituted a major portion of ulcers. Since beginning of 2003, 155 patients with foot disabilities including 62 with plantar ulcers were registered under revised prevention of deformities programme for treatment. Provision of MCR footwear, ulcer management specific to the clinical condition, training in self-care and counselling to patients constituted the revised programme. Considering the fact that the body weight of the patient is an important factor for causing ulcers, a systematic Biomechanical assessment of foot was introduced in the management of ulcers. The assessment was used to classify feet, provide suitable orthoses to facilitate healing. The analysis of biomechanical assessment showed that pronated feet were found in 76 patients Supinated in 30 patients. Orthoses were prepared as part of treating 62 plantar ulcers with plantar orthoses suiting the biomechanical status of the foot. Out of 62 patients, 81% of ulcers (50) showed complete healing. Improved self care, use of footwear was observed as contributing factors in ulcer healing during the follow-ups. The role of using orthoses and results in ulcer management will be presented in the paper.

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Role of Health Resource Centre in Community Based Rehabilitation in Leprosy

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Introduction : Leprosy has a unique social dimension of age-old stigma, with an adverse impact on the physical, socio-economic wellbeing. The rehabilitation of a person depends upon community. It became a reality due to community participation and involvement of Health Resource Centers (HRCs) as vibrant catalysts. This is an innovative approach adopted by LEPRA Society, Bargarh and this paper aims to assess the impact of these Centers. **Methodology :** Since 2004 till date 20 such Centers have been established in 20 Panchayats covering 6 Blocks of the District. They provided support to the project by means of awareness generation within the community through IPC, Rally, Street Play, meetings dealing with signs and symptoms of leprosy and stigma reduction. The centers also played a vital role in disability care and socio-economic rehabilitation. **Results:** The Centers are currently taking care of 375 leprosy disabled persons. They could incorporate 188 clients and 367 family members in SHGs and conducted 242 Disability Care Clinics where services were rendered on ulcer dressing, health education, self-care. These Centers could link 512 (M-321 & F-191) cured persons to various Government schemes or assistance, resulting in improved socio-economic status of 254 (49.6%). A study report of the project reveals that 95% of the stigma was reduced due to the active intervention by these Centers. HRCs are also actively involved in counseling to prevent worsening of disability, new case referral and motivation for RCS. The table below show the break-up of persons economically rehabilitated. **Conclusion:** With the facilitation by the HRCs the leprosy affected persons are socio-economically mainstreamed and the stigma is reduced to a fairer extent **Key words :** Stigma, HRC, IPC, SHGs, Rehabilitation

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A Study on the Effect of Intensive Health Education in Preventing Injuries or Ulcers in Anesthetic Limbs of Leprosy Affected Persons

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Prevention of disability of leprosy is a continuous process that requires special technical skills to identify and to achieve the goal. Selected leprosy patients with anesthetic limbs at the initial stage of disease or at the starting of the treatment. They were given intensive teaching over a period of two to seven months. Five years later these trained leprosy patients were compared with matching set of leprosy patients those who are not included in the study. The results are presented.

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Impact of A Community Based Rehabilitation Project In Improving Social Participation of Leprosy Affected Persons in Rural Maharashtra, India

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Introduction : Leprosy affected persons in rural Maharashtra still suffer from discrimination, unemployment and miserable living conditions. This study evaluates a CBR program in rural Maharashtra that was designed to improve social participation.

Methodology : 103 leprosy affected persons were assessed using the P-Scale which measures the extent to which people are restricted from social participation. Measures were taken, before and after a community rehabilitation program. (The scale has a range of scores from 0 to 72). The CBR Strategy used was formation of self help groups with people affected by Leprosy & general community, Micro-credit for small scale business, housing, farm development, as well as awareness programs in the community. **Results :** The scores before the CBR ranged from 11 to 72, with mean (SD) of 27.5(10.9). After CBR, the scores ranged from 3 to 42 with a mean (SD) of 12.9(8.0). Pair wise differences showed a mean (SE) difference of 14.6(0.9) and the 95% confidence interval from 12.8 to 16.4. The reduction of total score was statistically highly significant ($P < 0.001$). The impact by age group, gender and grade of deformity is computed and the implications of the findings discussed. **Conclusion :** Properly designed and implemented CBR programs can make a significant impact on reducing discrimination and social participation restrictions as well as increasing the quality of life of leprosy affected persons.

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Salvage Surgery for Severely Deformed Hands in Leprosy

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Mobile claw-hand and mobile opponens palsy are readily dealt with, by various techniques, by a number of surgeons; however severely deformed hands and metacarpal hands are, usually, left unattended. The reasons are many, one of which is the fact that most patients do not understand what we intend to do and how useful, after surgery, will their hands be. We have operated 9 deformed hands with procedures like 'Pollicization' Gillies' cocked-hat surgery, bone grafting and JESS distractors with the aim of giving a "functional hand" though not a beautiful one. The whole presentation will be illustrated with photos, pre & post and intraoperational. The results: quite satisfactory for the surgeon and the patients soon after surgery, but on a long follow-up, we have noted that two patients had again damaged their hands due to improper use and – most of all – to the fact that an "insensitive" hand is always prone to damage. Yet this does not discourage us from carrying on this type of surgery; however patients need counseling before surgery and after.

O-230**Corrèction of Muscular Wasting in the First Web**

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Many techniques have been described to restore the shape and bulky contour of the first web space, for cosmetic reasons. We have noted that the real defect lies with the first dorsal interosseus and the first lumbrical; hence we have planned a new technique for this type of deformity. **Operative procedure** : Local anaesthesia – without adrenaline- is all that it is needed; no tourniquet is required because the procedure is quite bloodless. A small incision is made along the radial aspect of the index just proximal to the head of the phalanx, care is taken for the incision to be **more volar than dorsal**. The incision goes down to the periosteum; now, with the help of dissecting scissor, a tunnel is made along the phalanx: the tunnel should be more volar than radial. At this point a tube of medical-grade silicone is cut in the way illustrate in photo N., the length has to be tailor-made so as to fit the length of the index, however, for the majority of patients 5cms is good enough. Next, the tube is anchored to the periosteum with one or two sutures of 04 mersilk. Closure is done in layers: the subcutaneous with prolene and the skin with any suitable material. Betadine ointment and soft dressing. The wound is inspected after two days for any reaction and the sutures are removed after 8-10 days.

O-231**"Plantar Skin Graft" – A simple Technique for Healing the Ulcers on the Sole of the Foot**

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According to basic principles of plastic surgery lost tissues should be replaced by tissues of similar kind. Thus, best option for replacing glabrous non-hair bearing plantar skin would be plantar skin itself. The instep area provides the donor site without much morbidity. Two techniques are used for harvesting the skin graft. Plantar graft taken from instep as epidermis and dermis and plantar dermal graft taken after elevating the split graft as flap and taking the inner dermal layer as free donor graft. Reintroduced by the first author to large masses at the IAL in 2004, it was studied in detail in dissertation by the second author. In the small study of 15 cases, it was noticed that patients with ulcers were in age group 40-50 years. Males had higher incidence of plantar ulcers as compared to females. Good results were obtained in almost 93 % of cases. Graft take was more than 80% in these cases. Healing was eventual outcome in majority of cases. The average duration for healing of ulcer was 2-3 weeks. Some cases were carried out in the camps held under the auspice of NCLCA. At follow up of this camp reasonably good outcome was noticed. The graft showed good color and texture match and minimal donor site morbidity. Plantar skin graft is a viable procedure even if it acts as biological dressing given the fact that majority of plantar ulcer cases are neglected in the rural areas. The technique has the potential to be carried out at community health center level where surgical operations are carried out.

O-232**Role of Anterior Ulnar Nerve Transposition in Acute Ulnar Neuritis - Indications, Surgical Techniques and Results - A Preliminary Report**

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20 ulnar nerve, hemi circumferential neurolysis and anterior sub-cutaneous sub facial sling transpositions were done for acute ulnar neuritis with or without neurological deficit. They all presented with severe pain restricting activity with that particular limb and with tender flexion angles of more than 100 degrees. All the patients had instant pain relief and the flexion of elbow became pain free post operatively. It is a simple surgery under local anesthesia and all the patients were given 1 week of low dose steroids instead of a 12-week steroid regime. The results of nerve function recovery seen with anterior transposition of the ulnar nerve are comparable with the 12-20 week regime of steroid therapy without any steroid related problems such as steroid dependency, osteoporosis or Cushingoid features. However it requires some amount of surgical skill and has associated surgical complications. **Key words** : ulnar nerve, acute ulnar neuritis, anterior transposition.

O-233**Factors Affecting outcome of Surgical Correction of Claw Hand in Leprosy**

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Introduction : The purpose of the study is to study the factors that will influence the surgical correction of claw hand in leprosy

Methodology : All patients who underwent claw hand correction over the period 2002 - 2005 were selected for the study. Charts were retrospectively analyzed and patients were called for assessment according to Brand's evaluation criteria and also assessment of patient satisfaction. 110 patients were included in the study. **Results and Conclusions :** According to Brand's criteria, 76.6% had excellent or good results, 26 % had fair results and 3.3% had poor results. As far as patient satisfaction is concerned 80 % were fully satisfied or satisfied, 17% were partially satisfied and 3% not satisfied. Age, duration of pre operative physiotherapy, degree of joint contracture and long flexor tightness had a statistically significant influence on the outcome of surgery. **Key words :** Surgical correction, claw hand, Outcome.

O-234**Effect of Microcellular Rubber on Pressure Distribution Under the Walking Foot**

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Introduction : The objective of the study is to measure the effect of different Shores (softness) of 12 mm Microcellular rubber in reducing peak pressures at vulnerable areas under the foot. **Methodology :** Plantar pressure measurements can be measured using various techniques with a mat with pressure sensors placed on the insole and then making the subject to walk. Tekscan is one such machine which when calibrated is accurate and records even minor differences in pressure reduction. The pressures were measured in shoe with and without the MCR insole inserts with the subjects walking. The shores of MCR tested were 10, 15 and 20 degrees. A total of ten subjects were used. Plantar pressures from five normal persons and five leprosy patients with anaesthetic feet were measured. **Results and Conclusions :** The results showed that 10 to 15 degree shores to be optimum and 20 degree MCR was not effective in reducing peak pressures.

O-235**Rehabilitation Awareness and Needs in Patients with Disability Due to Leprosy**

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Objective : To determine the rehabilitation awareness and needs in patients with disability due to leprosy. **Methods:** 4353 patients in 23 fields of 7 provinces were surveyed by interview and questionnaire. **Results :** 80% of patients knew general knowledge of disability prevention and rehabilitation, and believed that the self-care could prevent disability; but they seldom carried out the daily self-care practice. 90% of patients lacked awareness in early manifestation of leprosy, treatment of the disease, basic cause of disability, and the way to prevent such as plantar ulcers. For needs of rehabilitation education, teaching by medical staff (86%), booklet (81%), video tape (70%) and recording (52%) had been selected. **Conclusion :** The awareness of rehabilitation and the practice must be combined together. Rehabilitation education should be carried out in advance systemically through different ways. **Keywords :** leprosy disability; rehabilitation awareness; rehabilitation need.

O-236**Three - Year Results of Self-Care in 6442 Persons with Disability in Leprosy**Yan Liangbin, Zhang Guo-cheng and A Piefer

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Objective : To explore the effectiveness of self-care in persons with disability in leprosy. **Methods :** Self-care training was provided to 6442 cases of persons with disability through medical staff, followed by daily self-care by the patients themselves. The results were then followed up continuously for 3 years by medical staff. **Results :** 72.52% (4672/6442) cases sustain daily self-care. Redness of eyes reduced 76.82% (327/1411), cracks in hands and feet decreased 93.61% (130/2035) and 90.68% (180/1932) respectively. Plantar ulcers reduced 48.34% (1262/2443). There were no significant increase of bone loss in hands and feet. **Conclusion :** Daily self-care reduce the disabilities in hands, feet and eyes in persons affected by leprosy, and may also prevent secondary impairment or prevent deterioration of the disabilities. **Keywords :** disability; self-care; leprosy.

O-237**Nerve Damage of the Upper Extremity in Persons Affected by Leprosy**Yan Liang-bin, Zhang Guo-cheng and LI Wen-zhong

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Objective : To determine the situation of nerve damage of the upper extremity in persons affected by leprosy. **Methods :** Active or cured cases of leprosy in 11 counties of Jiangsu province were investigated. **Results :** 39.86% (5676/14240) cases were found with nerve damages in the upper extremity, with 28.58% (4070) unilateral and 11.28% (1606) bilateral. Nerve damage was more common in active and relapse cases (53.89%), in multi-bacillary cases (65.02%), and in persons had leprosy reaction (78.25%). 35.89% (5111) persons were found with Ulnar nerve damage, 15.52% (2210) with medium nerve damage, and 3.31% (428) with radial nerve damage. Protective sensation was lost in 64.31% (3650/5676) of hands and joint stiffness in 60.65% (3100/5111). 36% (2607/7282) persons have surgical indication, but of them less than 20% (520) willing surgical treatment. **Conclusion :** Incidence of nerve damage of the upper extremity in leprosy correlates with delayed diagnosis, type of the disease, and the reaction. Ulnar nerve is mostly involved, and often unilateral. 60% of the disability of the hands lost the opportunity for surgical correction, and 80% persons have no confidence in rehabilitation of the hand. Self-care training and functional exercise is need for them. **Keywords :** leprosy; nerve damage; upper extremity.

O-238**Long-Term Results of Posterior Tibialis Muscle Transfer for Foot-Drop in Leprosy**Yan Liang-bin, Zhang Guo-cheng, ZHENG Tis-hengr

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Objective : To determine the long-term results of the posterior tibialis transfer in the treatment of foot-drop in leprosy. **Methods :** The patients who received the posterior tibialis transfer operation during 1985 and 1996 were followed-up in the past three years. Walking gait, active dorsiflexion and plantar flexion of the ankle joint, deformities or ulceration of the feet, and patients satisfaction were recorded. **Results :** Of the 80 cases (82 feet) followed-up, excellent results were obtained in 51 feet, good in 17 feet, fair in 12 feet, and poor in 2 feet. Among 37 feet, which had interosseous transfer, excellent-or-good results were obtained in 31 feet, while 2 tendons avulsed postoperatively. Among 45 feet, which had circumtibial transfer, excellent-or-good result was obtained in 37 feet, while 3 developed new inversion, 2 toe-drops, 2 tendon adhesion subcutaneously, 3 with ulceration, and 3 had recurrent inversion. There was no significant difference in the excellent-or-good results between the groups of interosseous transfer and circumtibial transfer, and whether the transferred tendon attaching to bone or tendon ($P > 0.05$). **Conclusion :** Posterior tibialis transfer with elongation of Achilles tendon gives excellent or good results in foot-drop due to leprosy. The route and attachment point of the transferred tendon should be selected based on whether the foot complicated by inversion, toe-drop, or osteoporosis, and also the interosseous space size. Physical exercises are emphasized to carry out pre-and-postoperatively. **Keywords :** foot-drop; posterior tibialis muscle transfer; leprosy.

Practice and Thought About Rehabilitation Based on Community on the Disabled Affected by Leprosy

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Objectives : To explore experiences of Rehabilitation Based on Community (RBC) on the Disabled Affected by Leprosy (DAL) and to provide the evidence for solving sharp problems appeared from imbalance development of leprosy rehabilitation between Leprosy Village and Common Community. **Methods :** To select 2 towns with more DALs to be pilot areas to set up a Station for RBC in township hospital respectively. Under the leadership of governments on local county and township levels, to use the health resources of township hospital to free offer DALs with recovery service periodically. Certainly, the DALs are willing to participate the program, the township hospital and doctor offered service should be paid by local county health bureau. **Results:** The Station for RBC have run in right path and its range of service expanded around the 2 towns. Most part of DALs have cured or distinctly improved their exposure conjunctivitis, cracks of in numb hands and feet, foot ulcers. The style of the the Station for RBC have been accepted by local people and DALs. Finally, the township hospital and doctor offered service also earned from the Station for RBC service. **Conclusions :** RBC should be the most important part of leprosy rehabilitation. The general health services offer the rehabilitation of leprosy work is feasible, which only need pay a little. It also reflects and deepens the strategy advocated by WHO on the sustainability of Leprosy Control Program. **Key words :** Leprosy The disable Rehabilitation Based on Community.

Microfasciculation : a Peculiar Nerve Response in Leprosy Nerve Damage

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Microfasciculation, a perineurial response found in neuropathies was studied in 240 nerve biopsies [118 pure neural leprosy (PNL), 31 reactional leprosy neuritis (RN), and 91 non-leprosy neuropathies (NLN)]. Live *M leprae*-induced desert hedgehog factor (a cytokine involved in nerve fascicle assembly) expression in human Schwann cells (SC) was also investigated. Microfasciculation was found in 18 nerve biopsies (12PNL, 6RN) but not in the NLN group. This finding was strongly associated with perineurial damage and with the neuritic process. S100 protein immunoreactivity, neurofilament, nerve growth receptor, and myelin basic protein immunoreactivity were found within the microfascicles. Transmission electron microscopy of three biopsies showed that surrounding fibroblast-perineurial cells were devoid of basement membrane despite NGFr positivity at immunohistochemistry. Dhh expression by human SCs *in vitro* was downregulated by *M leprae*. Perineurial damage and downregulation of the desert hedgehog factor may be implicated in the genesis of this reactive lesion pattern. **Key word:** microfasciculation, leprosy neuropathy.

Free Papers - Social Aspects

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Leprosy After Elimination : Putting Back Those

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While the drive towards a world without leprosy has made very significant progress, the focus on treating new cases has also had the effect of pushing a wider group of people whose lives have been negatively affected by leprosy further into the margins. This paper draws on long-term intensive fieldwork with a particular group of leprosy-affected people in Andhra Pradesh, South India, to address this issue in two key ways. Firstly, it analyses some of the problems faced despite—and, sometimes, because of—the elimination of leprosy by cured leprosy-affected people and their families. Secondly, it considers how we might address those problems in a world where leprosy is no longer a major health problem: not, as is usually the case, by assuming particular goals of rehabilitation, but via an ethnographic exploration of how those I worked with managed their everyday lives.

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Exploring Grassroots Leprosy Organisations

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Leprosy has been a scourge and a source of fear for thousands of years with social exclusion and disempowerment resulting for millions of people. This paper, based on my thesis, explores reasons for the recent emergence of grassroots leprosy organisations; whether leprosy-affected people can achieve social inclusion and empowerment through membership in such organisations; and to what extent are grassroots leprosy organisations accepted by international anti-leprosy organisations and is it possible to have meaningful alliances and partnerships between them? Through field visits to undertake case studies of two such organisations, ENAPAL¹ in Ethiopia and HANDA in China, I was able to use a combination of methods of inquiry including semi-structured interviews and focus groups, along with participant observation. The paper brings together the case study information, research aims, ideological contexts, other academic works, and discusses the results that emerged. The results indicated that, firstly, the failure of welfare programmes plus the common experience of leprosy and subsequent human rights abuses have driven leprosy-affected people to join together in collective action; secondly, working with a participatory approach that attributes as much importance to *process*, i.e. a bottom-up model of working, as to *results* contributes significantly to the sense of belonging that membership in grassroots organisations has brought about; thirdly, meaningful alliances and partnerships are possible with some international anti-leprosy organisations but much depends on the organisational culture of each organisation; and fourthly, membership in grassroots leprosy organisations is achieving a measure of social inclusion and empowerment for the members. In conclusion, the research asserts that ENAPAL and HANDA arguably have as their membership some of the world's most oppressed people. Yet, as constrained as they are, these people have shown that through the strength of collective action and solidarity they can be change-makers. During the research the work of Paulo Freire² (1989) is recognised, in particular, his insistence that, with appropriate conscientisation, oppressed people must struggle for their own interests and not leave their fate to others. This paper affirms Freire's claim, that the finest struggles with the best results are those fought by oppressed people themselves.

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Assessment of Stigma Against People Affected by Leprosy and Those with Other Disabilities in War – Affected States of Darfur

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In 2000, my predecessor conducted a KAP study in the population of West Darfur on Leprosy and Polio. 90 per cent of people interviewed recognized that they could not shake hands or share a meal with a person affected by leprosy, while this figure was 45 per cent for people affected by polio. A participation scale was used to assess perceived stigma. The interview was conducted using some parameters such as age, sex, marital status, level of participation restriction of people affected by Leprosy and other disabilities, members of the union of disabled. The study was conducted in the 3 capitals of Darfur States. We found that there was no direct relation between the result of participation restriction of people affected by leprosy in the community and their level of participation in the union of disabled. We think that the level of participation in the Union of Disabled found in Geneina which was the highest is due to three reasons: the union of disabled premises is built near the leprosy willage of Geneina. The Geneina Union receives food for all from World Food Program (WFP). And finally, the Geneina Union is having a representative of people affected by leprosy in the governing board. It will be useful if we could develop a tool such as Participation scales to assess the level of participation of people affected by leprosy in a union of disabled. The intervention like community awareness should tackle the level where the restriction is found. **Keywords :** Stigma, Leprosy, Disabilities.

The Advisory Council of the Tavares de Macedo State Hospital : An Exercise in Citizenship and Democratization

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The Tavares de Macedo State Hospital (HETM in Portuguese) in the State of Rio de Janeiro is one of 33 Hansen's Disease (leprosy) colony hospitals in Brazil. In July 2007 the hospital had 192 beds, of which 120 were inactive. 72 beds were in use, distributed between five wards and four shelters. Of the latter, 80% were in use due to the particular social needs of the patients. Of a total of 47 patients admitted to the wards and requiring clinical treatment and / or nursing care, 46 were ex-carriers of Hansen's disease, the majority of whom presented clinical conditions unrelated to the disease. Only one patient was undergoing active treatment for the disease. The aim of prioritizing the health and social needs of the residents of this community - ex-carriers of Hansen's disease - was formative in the creation of the Advisory Council of the HETM. This initiative is the central strategy of the citizenship project undertaken by the Movement to Reintegrate People Affected by Hansen's disease (MORHAN in Portuguese). The objective of this project is to open up possibilities for the users of the services of the Tavares de Macedo State Hospital to be reintegrated into the community. The Management Council supports and oversees strategic planning in which users decide together about the purposes of the hospital and evaluates the attainment of defined objectives and aims. The council is the forum for intense discussion related to all areas of the hospital, including ambulatory, clinical, shelter and community services, with the goal of assuring quality and meeting the needs of the users of these services. Representatives of these users account for half the seats on the council, with the remaining places allocated to management and staff. This model, in which monitoring of the services offered to ex-carriers of Hansen's disease is undertaken by the users of these services, is one of the components of the movement towards democratization and citizenship, which is producing in a participatory way improvements in the quality and way of life of this community. The results of this process will be presented and discussed.

Keywords : Colony Hospital, Leprosy, Hansen's Disease, Citizenship, Tavares. Macedo, Advisory Council, MORHAN.

Integrated Care for Ex-Carriers of Hansen's Disease – A Challenge for a Colony Hospital

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An effective care policy for patients with Hansen's Disease (Leprosy) requires integrated care, which necessitates the creation of a system which guarantees integrated care for these patients. Negotiations and agreements with the municipality of Itaboraí (Rio de Janeiro State, Brazil), for example, where two family health teams cover the residents of the area, a holdover from the policy of compulsory isolation, are fundamental for the redefinition of the Tavares Macedo State Hospital as a reference center for physical and social rehabilitation. The strategy suggested here for the delivery of integrated care to patients with Hansen's Disease resident in the vicinity of the hospital should be understood as a phase of transition away from an inadequate and inefficient mix of medical and social care. The spectrum of care, from the home visit by the family doctor to the defining of a solution for the social situation of each individual resident, needs to be concomitant with the adoption of effective management initiatives aimed at improving the quality of life for those suffering from sequelae of Hansen's Disease. The implementation of such an integrated care strategy for patients resident in the areas of former leper colonies or specialized hospitals will only be possible on the basis of a policy decision by State Department of Health, differential allocation of resources for medium and high complexity care and the adoption of an articulated network for health service referrals. In order to maintain and consolidate such an initiative the State will have the contribution of the Movement to Reintegrate People Affected by Hansen's Disease (MORHAN in Portuguese) in regulating the measures taken by the patients themselves, as well as technical support in defining the directions to be taken in regard to land ownership and the limits and possibilities for initiatives aimed at the rehabilitation of the citizens of this community.

Keywords : Colony Hospital, Leprosy, Hansen's Disease, Tavares Macedo, Integrated Care, MORHAN.

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World as One Family by Work Camp

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JIA was established in August 2004 to coordinate volunteer work camps in villages affected by leprosy (Hansen's Disease, HD) in China. JIA stands for "Joy in Action" and is homophonous with the Chinese character "home" or "family." From 1950's, the Chinese government relocated people with HD to mountain areas (we call "village" and "villager" here). Till now, 617 villages still exist. Even though the disease of almost all villagers has been cured, many still cannot go back home because of the stigma. The villagers today suffer from the disabilities, poor medical treatment, poverty, and loneliness. JIA aims to alleviate their suffering through hosting work camps in their villages. Typically more than 20 volunteers live there together with the villagers and carrying out construction project. This action establishes personal relationships among the villagers and volunteers, and the people outside comes to realize that they do not need to be afraid of HD. Action exceeds thousands of words. In order to solve more problems that the villagers are suffering from, JIA set up Volunteer Team Network, that is: Legal Aid; Case Work; Information; Project Development; and Alumni Team. Now, our volunteers can often listen to villagers' voice such as: "You are closer than my children". **Keywords** : Volunteer Work Camp; Network; Homy.

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Stigma, the Main Challenge for the Implementation of the New WHO Strategy in Khartoum

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Despite the joint effort done by the National Leprosy Control and ILEP members in fighting Leprosy, the result of the main indicators remains below the acceptable standards: Stigma affects all the components of Leprosy control e.g. the case finding with the grade 2 disabilities 16%; the case holding with a low completion despite the fact that 80 % of patients are treated by a specialized, well trained and committed staff. A review of registers and patients cards combined with interviews of staff and patients on treatment have shown: That more than 45% of new cases come from outside Khartoum. When asked to go and follow their treatment in the nearest health facilities, most of them refuse to go back home. Some give even false addresses to prevent any initiatives of contact or defaulter tracing. Only few patients on MDT disclose their sickness to their family. Only one hospital admits leprosy patients with severe reactions. Because of stigma among health personnel, the effort to establish rehabilitative and reconstructive surgery has failed in the last five years. Fighting stigma against Leprosy should be the first priority of the Leprosy Control Program in Sudan, which should learn from the experience of HIV and Polio program. There is an urgent need for a hospital which will provide integrated rehabilitative and reconstructive surgery. **Keywords** : Stigma, WHO, Strategy.

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Best Practices in the Socio-Economic Rehabilitation of Persons Affected by Leprosy and Other Marginalised People in Their Communities : Findings From Nine Evaluations in Bangladesh, India and Africa

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The present paper presents an overview of findings from the formal evaluation of 9 socio-economic rehabilitation programmes implemented by TLM in 4 countries in Africa, in Bangladesh and in India in the years 2002-2005. Bringing together the recommendations resulted in a description of best practices in the implementation of socio-economic rehabilitation programmes, derived from actual experiences in different contexts. The 9 programmes all focussed on supporting individual leprosy-affected beneficiaries or their families. Four projects also supported other marginalised clients. The usual interventions were micro-credit, housing and sponsoring of education for the children of clients. The recommendations touched on each of the five steps in individual rehabilitation: Selection of clients, needs assessment, choosing an intervention, monitoring / follow-up of clients during, and separation at the end of the rehabilitation process. The evaluators also suggested ways in which participation of clients in their own rehabilitation might be boosted, made recommendations for the organisational structure of programmes, on maximising community involvement and emphasised the importance of information systems and of investing in the programme staff. A number of recommendations were specific to the types of interventions implemented i.e. housing, education or micro-credit. Evidence for the impact of SER on quality of life of clients is limited but suggests increased self-esteem and increased respect and status in family and community.

O-249**Hansen Disease Recoverers as Changing Agents**

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The purpose of this study is to examine the activities of the patient associations and individuals to improve their living conditions and to reduce negative stigma and discrimination against Hansen Disease patients. This study can be done from the Sociological viewpoint using disability studies and social movement theories. The method is case study, one of the qualitative researches to reveal the ordinary life of people. I will focus Zen-Kan-Kyo, which is a patient association established in 1951, to unite the voice of those who are institutionalized in the National Leprosy Sanatoria. Data was collected from many sources, such as published matters, literatures, newsletters, and unpublished documents. Also, there were in-depth interviews conducted with the people who contributed to the association for a long time. As a result, it was recognized that patient associations challenged various fields and had a great influence on healthcare providers, politicians, mass media, and common citizens. In conclusion, it can be said that supporting patient associations financially, politically, and sympathetically is effective to improve conditions and reduce negative stigma. **Key Words** : Patients Association, Social Movements, Changing Agents, Case Study, stigma.

O-250**Stigma Against Leprosy Patients in Mahasarakham Province, Thailand**

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Introduction : As stigma is a major treat to leprosy eradication, this study aiming to explain; the untoward behavior of health workers and people against leprosy patients, and the perception of patients. **Method** : Qualitative study using in-depth interviews and observations in 4 health workers, 31 people and 6 patients. **Results** : Majority of health workers had aversion to patients because of belief that leprosy easily spread, said that the people bad behaviors because of fear of leprosy especially severe symptom patients and thought that there was self stigma. Among people, females had higher proportion of fear than males. Elderly people had the highest proportion of fear because of inaccurate knowledge. A majority of patients with no disability did not feel discouraged but lost of self esteem, and were afraid of patients with bad image. Factors contributing to stigma among patients were; inaccurate knowledge and belief. Most cause of fear is disease contracting. **Conclusions** : Stigma could result in disease spreading and emerging. All stakeholders, especially health workers should be the model by not expressing untoward behavior against leprosy patients. Leprosy knowledge should be transferred to new generation. **Key Words** : Stigma, Leprosy.

O-251**Community Participation in Empowering Development of Mae Lao Leprosarium, Chiangrai Province**

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Introduction : The participatory action research on community participation in empowering development of Mae Lao leprosarium, aiming at social integration into normal community in the near future. **Methodology** : PAR, In-depth-interviews, FGDs, group process, AIC and community organization, Population involved in the study were 60 leprosy patients and 255 their family members, 55 leaders in Mae Lao leprosarium and two nearby communities selected for the study. **Results** : 76.64 percent of leprosarium members were satisfied with their present status and living, 65.69 percent expressed status-quo and 24 percent agreed to integrate the leprosarium into normal village. Findings from the study also revealed that two representatives from the leprosarium were already elected as members of tambol administrative authority to vote for financial support to community development of the leprosarium. **Conclusion** : Empowering development could enable leprosarium to be self-supporting on sustainable basis. In addition, attitude of nearby communities and related government and non-government sectors appeared to be positive and favorable for social integration. **Key words** : Community Participation, Empowering Development, Leprosarium.

Factors Contributing to the Poor Participation of Leprosy Affected Persons in SHGs

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The social inclusion for persons with disability into mainstream society is one of the important facets of any rehabilitation effort. The formation of integrated Self Help Groups is one of the strategies of bringing about social inclusion of persons living with the consequences of leprosy. However, in the Community Based Rehabilitation Program at the Schieffelin Institute of Health-Research and Leprosy Center, we observed that the participation of persons affected by leprosy in the SHGs was poor when compare with persons with locomotor disabilities. The aim of this study was to identify the factors that contribute to non-participation of persons affected by leprosy in SHGs. We used both qualitative (Focus Group Discussion) methods and quantitative (questionnaire survey). A questionnaire was administered to 60 persons affected by leprosy who were members of SHGs and 60 who were not members of SHGs. For comparison, the same was administered to 60 persons with locomotor disability who are members of SHGs and 60 who are not members. Focus group discussions were held with the different groups in terms of gender and age group. The data is being analyzed and will be presented.

Overcoming Human Rights Violations Against People Challenged by Leprosy in Africa (Kenya) Within the Context of African Culture

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This paper will highlight the history of human rights violations against people challenged by leprosy within the context of African culture. It will explore how individuals challenged by this disease learned to adapt to the conditions that violated their human rights. It will also discuss the negative impact of these human rights violations such as secret burial sites, cultural ways of losing dignity and the negative belief systems that have developed against people challenged by leprosy. It will also explain new concepts, tools and strategies that IDEA Kenya has developed that are being used to solve this problem in the 21st century including Youth Empowerment Programmes and Ecotourism Programmes. Last but not least it will show some positive fruits of the new concepts being used to solve the problem of human right violations and illustrate how a bad history can be used in cultural tourism to empower the local community who have been challenged by leprosy and stigmatized by society. In conclusion, it will highlight challenges that are being faced as we work to solve the above problems and present recommendations on how to overcome human rights violations against people challenged by leprosy in the 21st century. **Key Words :** Human Rights, Stigma, Empowerment

Contribution of Leadership in Developmental Programme of Self Settled Colonies in State of Maharashtra

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Object : The main object of the study was to access impact of the leadership towards the developmental programme of self settled colonies & find out the programmes successfully implemented by the leaders. **Preamble :** In Maharashtra there are 37 self settled leprosy colonies which were identified during the survey conducted by leaders in collaboration with IDEA India . Approximately 15,000 Leprosy Affected Persons & around 30000 family members living in the shadow of these colonies. During the survey it was observed that there is a good leadership coming up in the colonies which is involved in developmental programme of the colonies. So it was decided to major the impact of the leadership in the developmental programme of the colonies. **Methodology :** Questionnaire was prepared & data was collected through social workers working in the field of leprosy & having close contact with colonies. State level association namely Maharashtra Kushtpidit Sanghatana has played an important role in this survey. **Results :** No. of Colonies Total families (No. of families) Total Popularity 37 15,000 45,000 Educational Status:- Illiterate 3209 Primary 4159 School 1726 Higher Secondary 222 Degree 68 Technical 18 Developmental work carried out successfully through leaders - 1. 100 % Registration of the colonies with Government. 2. All the 37 colonies have got primary or secondary schools in their vicinity. 3. Leadership is responsible for creating awareness about the rehabilitation programme run by Government & NGO's among the colony members. 29 colonies out of 37 received assistance under Government scheme. 4. All eligible colony members have received Ration card & Voter's ID Card. 5. Leaders of different colonies organized the meeting with Chief Minister of state & Deputy Chief Minister of state. They have confidently interacting & putting their problems with Government authorities, Secretaries, Collectors at local level, which helps them to solve their problems. **Conclusion :** With the leadership colony has achieved good progress. It has helped in developing strong networking among the colonies. They started working under one banner which leads to unity of the people. So it is felt that leadership should be developed & trained at different levels.

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Introduction : The role of A.P. State Leader aims at bringing all colonies under one Umbrella, to empower them in Utilizing their rights, to increase their income, to get educational, rehabilitation, Medical, Health, and Monthly Pension facilities. **Activities for Implementation :** We met the Governor of A.P. and submitted our requisition to provide all facilities possible by the Government to the persons affected with Leprosy. It held Press Conferences in Hyderabad and also in other important Towns, to create awareness of our problems in the Public and Private Sectors. We conducted Interview with the beggars of the Leprosy affected, by the High Court Advocates at Vidyanagar Railway Station in Hyderabad . We sent our application to all the Ministers and all MLAs of A.P. State. We conducted a big Rally with 5000 Persons from Leprosy Colonies in Hyderabad . **Achievements :** The Government of A.P. responded and gave assurance to provide Anthyodaya Annayojana Ration Cards to the affected persons. The High Court Advocates, in participation with Human Rights Committee, filed a petition in the High Court demanding provisions to the affected persons. The High Court gave verdict to issue Bus-passes on concession to all the eligible affected persons. **Hindrances :** We find that the colony people want immediate result. They seem to have no patience to wait for result. They also do not help and Co-operate with the State Team particularly in respect of finance. With the help of some individuals, the team has overcome to some extent the financial Problem. **Failure :** All members in the Action Committee are very poor. So, they face monitory problem for their movement from one place to the other. **Conclusion :** However, we try our level best to convince the colony people by explaining the facts and get their support.

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Introduction : Generally, persons affected with leprosy live in poverty, away from The Community due to stigma. **Colonization:** They do like to live with the persons like themselves. So, they start living in the colonies. **Disability Act :** A 1995 Leprosy cured persons are also included in the list of disabled persons under P.W.D. Act Like provisions to certain categories like Backward classes S.C. S.T etc., they are also provided some facilities like monthly pension, free bus-passes, rehabilitation facilities, reservation in employment etc. **Micro-Finance :** Now a days, Micro Finance System helps people to increase income. We formed nearly 1500 Self Help Groups consisting of some leprosy persons in Khammam District of Andhra Pradesh. It is done in association with the Disability Association Net Work. They save some money and deposit the same in the bank. After half year or one year, the Government considers these S.H.Gs and advance loan for any income generating activity. With the help of this kind of financial help on nominal interest basis, the persons in these groups are able to increase their income and become advanced economically. **GROUPS:** In a Self Help Group consisting of 10 to 15 members. 4 or 5 persons belong to leprosy affected. Thus integrity of leprosy cured persons is also possible besides economic advancement.

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Leprosy has been associated with stigma and social exclusion through out the history. Stigma can be defined as an attribute that is deeply derogatory. The stigmatized individual is one who is disqualified and rehabilitated from his social life, earning place, community religion, with no respect/regard of his peers accorded, and putting him to shame, frustration and lack of self confidence that may generate suicidal tendency. 4 such suicide cases have been brought to my notice . Due to society's stigma and unacceptance of leprosy sufferers, they set up own colonies, own society and lead a new life practicing community religion freely. Concealment of early signs of leprosy results in more significant deformity. Rehabilitation of deformed patients, society's acceptance of all leprosy patients have to be intensified. Incidentally, following movements/agitations carried out by us, about 500 ex-patients have been fully rehabilitated through Govt.- service, and their social acceptance also stands retrieved. The leprosy Mission, HKNS, GMLE and other NGOs have been found to be working in CBR. We are also doing similarly through Panchayet, Municipality, NGOs involvement by arranging poultry, goatery, piggery, etc. for the beneficiaries. In the integration process, stigma is difficult to be reduced fully. Even many doctors bear high level stigma against leprosy afflicted for which the victims, as indoor patients, do not get facilities that other general patients avail. Stigma can be bought by using non-derogatory terminology, by repealing discriminatory laws and by making available accurate information about the diseases self—stigma can be reduced by support, encouragement and rehabilitation of the afflicted.

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Childhood is the most precious stage in a human. But education standard of leprosy sufferers' children is pathetic and linked with socio-economic condition of the leprosy colonies. Out of 2156 children in W.B. State leprosy Colonies 1062 go to schools. Of 285 school non going children 80-100 accompany parents for begging. About 809 are under aged. Education has to be reached to these 1000 children, present resource is 5 Primary School and facilities for 225 students in the state leprosy colonies. Most children and parents posses no idea about higher education, bright future, and, hence their aversion to being educated. With education received boys and girls of 20 / 22 families have been able to bring about economic affluency in family while about 300 boys and girls with secondary level education received remain unemployed. Spread of colony education need as follows:- 1) Economic improvement of inmates 2) Colony with just 20 students need a primary School. 3) Free fooding, dresses, learning materials, special coaching arrangements is necessary. 4) Post education vocational training with assurance to became self reliant is required. 5) More free hostels, or expansion of seats of the existing hostels. 6) Family Planning in the colonies. 7) Political goodwill for spread of education in the colonies. Nowadays Govt. NGO, even Colony a person have organized themselves and is coming forward to over come the situation. Children also are gradually realizing the meaning of life-for living healthfully like others. Thus radical change of the colonies will encourage common people to integrate themselves with colony people.

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Introduction : In the modern times, people affected by Leprosy also are considered as citizens of India like any other persons.

History : In the past, due to Stigma and discrimination, they lived in colonies situated far away from residential areas.

Empowerment: persons affected with Leprosy are included in the list of disabled persons as Leprosy cured persons, with certain facilities. As they are innocent, there is a need to empower them with the knowledge of understanding their rights.

1st Work Shop : The First empowerment work shop conducted in Vijayawada in the beginning of 2006 with the help of IDIA-INDIA, was attended by the representatives of 56 colonies in the State.

Out Come : Colony representatives understood their rights of enjoying primary needs of life, right to live, right to work etc., Ø They constituted themselves in to a Society at the State Level.

The Action team elected by them visited all Leprosy Colonies in the State and imparted the knowledge to the colony people. Ø

It conducted press meetings to create awareness in the Society and in the empowerment. Ø It started fighting to solve the problems of colony people for increase in pension, ration cards, bus passes, rehabilitation, medical and educational facilities, not only through request to the Government but also through filing a petition in the high court of justice. Ø The Government reacted to our effort and sanctioned AAY Cards. Bus passes, medical and rehabilitation facilities etc.

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Integration of leprosy colonies with the community Leprosy is an age-old disease. Due to social discrimination leprosy affected live as outcast in leprosy colonies. Leprosy creates problem that has different directions- 1) Health, 2) Social, 3) Psychological, 4) Rehabilitation. Presently, MTD-treatment has almost arrested the disease. Now society's outlook remains to be changed. For that, right information have to be reached to the society. a) Leprosy is curable, b) Leprosy is least infectious, c) Free treatment) Early detection/ treatment prevents deformity, e) Reconstructive surgery to correct deformity. It is time now that leprosy colonies be no more socially segregated. General community Be imbued with ideas that they too are part and parcel of the society and that they form country's human resources. In this regard society's goodwill and scientific out look is essential. If necessary, we have to go to the community stressing that we are at no fault-we are but your man-and that is our great identity. Now the following arrangements have to be ensured in leprosy colonies for social integration. 1) Socio-economic Development,, 2) Education, Health Education,, 3) Total treatment Provision, 4) Games, cultural improvement, 5) Environment Development, 6) Patient Education, 7) Marital Integration. Side by side, colony people owe responsibility of keeping their own surroundings beautiful. Because, man loves beauty. The first ward of the creation has been love. So, let us love each other and let this be the motto of our social and practical life. Thus, live and let live. Gurupada Mandal Secretary.

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I whole heartedly welcome the learned delegates to the 17th International Leprosy Congress. I have chosen the stigma and un-equality of leprosy patients as my subject. Out of 350 persons affected by leprosy found during the survey by Sarthak Manav Kushthashram Ajmer Team, 100 persons affected by leprosy personal data was collected and the same was verified by the Coordinator Ajmer Sh. S.S. Rajput. The Extracts of the survey report is given below: Rajasthan was always a monarch state. In Ajmer during the Muslim rule the British Government entered in Ajmer politics through the English company medium. Because of the religious importance of Khawja Sahab's Tomb and the Holy lake of Pushkar there was an abundance of persons affected by leprosy visiting these places in the hope of curing themselves. According to the survey the ratio of persons affected by leprosy is 3% Hindus and 21% Muslims and the local persons affected by leprosy were 76%. Considering leprosy as stigma the ratio of Muslims community was 13% and Hindu community was Nil and the stigma ratio was 10% in males and 3% in females. The feelings of the society and friends as leprosy being a stigma towards the family and persons affected by leprosy as in the ratio as 82% normal behaviour and 15% males and 3% females were treated as people to be avoided. The result of all this behaviour was that 13% persons affected by leprosy were treated as stigma and hence they had to depart from their homes for the benefit and marriage in their family. One more truth also came forward that even after leaving their family these persons affected by leprosy use to help their family monitorally. The datas also show that persons having deformity had to face the above said troubles, where as persons affected by leprosy without deformity were treated normally. So we can conclude from the above matter that as 82% persons affected by leprosy were treated normally and leprosy was not treated as a stigma. As far as un-equality of persons affected by leprosy is concerned the ratio is 26% Muslims and 3% Hindus. The scenario of un-equality in mode of transport was reported to be 3% and in government hospitals 14% persons affected by leprosy were treated as people to be avoided and the stigma in the working places of persons affected by leprosy was 12% with no difference in male and female persons affected by leprosy. From the above we can come to the conclusion that persons affected by leprosy who were deformed had to face the un-equality stigma while traveling. The second most important fact which has come to light is that in government hospitals that all persons affected by leprosy if they are monetarily poor or even if their behaviour is beggarly they are ignored by the medical staff. On the basis of the result of the above survey we can say that even though the persons affected by leprosy are deprived from their families and society they still have a desire to live. There is not even a single evidence of any persons affected by leprosy committing suicide and the biggest surprise is that even though these persons affected by leprosy are deprived of being a part of the family still praise and pray for the benefit of their family. Lastly I would request the learned members to note this point that treated persons affected by leprosy are not concerned about their reputation but are eager about their family self-reliance and health. There should be a guarantee that persons affected by leprosy should be made healthy then only we can look forward in making them useful members of the society. Once persons affected by leprosy are healthy they will themselves work like normal human being of the society and the stigma of leprosy will vanish. I would also like to add alongwith the above that if deformed persons affected by leprosy can be cured medically of their deformity this will be a miles stone in their struggling life. Thanking you, Jai Hind.

The Influence of the Change of the Terminology Leprosy by Hanseniasis in Former Patients Residents of Former Hospital Colony

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The use of the terminology leprosy and yours derived it is prohibited in Brazil by the law promulgated in 1995. (Law n° 9010 of 29-03/1995). This legislation was defended by some specialist doctors, mainly Dr Abraão Rotberg and by the Movement for the Reintegration of People Afflicted by Hansen's Disease (MORHAN). This work evaluates the influence of this terminology change in the former-patients' life that suffered the social isolation and still stay as residents in former-hospitals colony. The methodology used was the oral history through semi-structured individual interviews, audio-recorded, after signature of consent term. Upon analysis of the interviews it was inferred that the substitution of the terminology leprosy by hanseniasis just contributed to minimize the stigma and for most of the interviewees, what really made difference in the social life was the proposal of a really effective therapeutics that made unnecessary the compulsory isolation. These results can supply subsidies for the elaboration of proposals in the sense of rescuing the residents' citizenship in former-colonies for leprosy patients and inclusion in a fairer social context. Leprosy, hanseniasis, leproserie in Rio de Janeiro state.

The Sociological Study on the Formation of the Foreign Aid Project's Models of Korean Hansen People's Organizations

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Introduction : Early 1990's Hansen people in S.Korea also made organization to help Hansen people in many countries who still have experienced discrimination, segregation and hunger. It is significant that the Hansen people who the receiver of the aids now help the groups sharing similar experiences. In this paper I will focus on the formation of the foreign aid project's models of Korean Hansen people's organizations. **Methodology :** 1. Analyzing several government documents, medical news papers, anniversary books of Hansen people's foreign aid organizations. 2. Interview with the leaders of Hansen organizations, Hansen people in Korea and Philippines, workers of WHO. **Result :** 1. There are several socio-structural elements affecting the establishment of these organizations. Firstly, the Korean civil society expanded their range of activities into overseas, in this case especially Korean Hansen people started to work and to meet foreign Hansen People and encountered their miserable lives sympathizing with them in overseas. Secondly, they share the experiences of economic development and religious activities. 2. The Korean international aiding works are divided into the social development-orientated model and the mission work-orientated model. Two models, however, are not clearly distinguished from each other. They are in consistent negotiation and conflicts. 3. The Korean Hansen overseas aid works are changing according to the inner and outer situations of Korean Hansen society. First of all, they started to work not only for Hansen people but also for other people in needs. Moreover, the working area is also expanding in two models. **Conclusion :** The work models of the Korean Hansen overseas aiding agencies developed in 'path dependency'. The overseas aiding works are determined based on the Korean Hansen people's experiences rather than on the needs of local Hansen people. Therefore, the merits and demerits of Korean Hansen experiences can be succeed into the overseas Hansen works.

Magnitude of Educational Problem in the Colonies & an Attempt to Overcome It

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Object : To collect detail information on educational background of the children of Leprosy Affected Persons & their problems. **Preamble :** It is understood that the students living in the colonies do require some support. To understand the Magnitude of their problem a study was conducted in collaboration with IDEA India & Hind Kusht Nivaran Sangh in selected colonies. **Methodology :** Personal interviews of students & parents from the colonies were conducted; also base line data was collected through questionnaire. 726 primary students, 122 higher secondary students were interviewed along with their parents in this Pilot study. **Problems identified :** 1. Majority of the students were from socio-economically backward sections hence financial support is require to complete the higher education. This is the basic need. 2. Some desirable students find it difficult to get the admission for higher education due to competition. 3. Fee structure for various professional courses are also very high which leads to no admission in the respective institution to get admission. 4. Due to their Leprosy background some students requires psychological support to regain confidence. **Suggestion :** 1. It is observed that financial support should be provided at primary & secondary level to maintain the continuity in education. 2. Eligible students of higher education should be given assistance in fees. 3. Personality development programme should be organized for all students to build the confidence. 4. Competitive exams training programme should be organized. Continuous financial, psychological support counseling helps the student to complete their studies. Some beneficiaries of such support has obtain degrees in Engineering, B.Com, M.Com, etc.

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Role of State Leader in Development Activities

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In the battle of leprosy, leadership's role is under deniable. For leadership a scientific organization is necessary. For solution of the problem leadership should know its different aspects, its depth, existing mechanism for solution and practical sense. He should posses fighting spirit ability to train honest, trust worthy and fighter companion through organization's branch/district level sittings meetings and issue based movements. In 1978 during our initial movement period, leprosy sufferers lived out cast in shops, ponds, conveyance, offices, temples, etc. Struggling against the hindrances through sustained agitation, in the field of education care of old aged, employment, removal of stigma its success is partly achieved. But yet the issues like Dressing out fit with expt. Dressers in colonies and sub centres, MCR shoe supply, all treatment facilities in leprosy Hospitals, high level Research an anesthesia, infertility etc., State and Central level rehabilitation budget, pension, Patta, are to be met. Early treatment, proper subsistence for the afflicted, deformity prevention, publicity of elementary science of leprosy constitute firm base of social rehabilitation .With deep motherly feeling Mother Teresa draw leprosy victims near her heart while many NGOs are devoted to leprosy work in our state. Joint programmes on health education with HKNS & MKNS we have performed. Presently ILU has taken initiative NGOs net working. State leader should know details of Govt. and NGO activities, In this respect we have quite some drawbacks yet. Until realization of total emancipation from stigma, complete rehabilitation, organization and state leaders work would go on.

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Experience of Self Empowerment

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The author describes in his paper the success he met in marketing his products. One is the computer software he developed for accounts maintainace, the other about the marketing of agarbathis made by village ladies who were below poverty line and the third one is about manufacturing, packing and selling of dhoop sticks made by handicapped leprosy patients who formed as association for themselves. About 10 persons were motivated in to this project. As a person affected by leprosy the author describes as to how he openly admitted to the prospective buyer about his health and how the society received him with out any stigma. Also he narrates his experience with voluntary organizations like Rotary clubs and Lions club and their offer of help towards the cause of handicapped. Summarizing the paper the author claims that any resourceful person affected by leprosy should project himself as a role model and snatch the initiative. He claims that stigma in the minds of patients should be eradicated first and then only they can meet the challenges of the society.

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An Educational Video Construction – Life Doesn't Stop : Recognizing and Curing Leprosy

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Leprosy is an epidemiologic relevance's disease in Rio de Janeiro which shows high detection levels and late diagnosis. The necessity to make educational activities in leprosy more intense, motivated the Rio de Janeiro's Municipal Secretariat (SMS/RJ) to produce a film named: "Life doesn't stop: Recognizing and curing leprosy". The goal was the disease's disclosure among the health units and the people in general. This study describes the making off the video elaborate in Rio de Janeiro city in 2003. The main questions come from researches around leprosy's socials representations with sick people, their families and health area professionals. A multidisciplinary team worked on the film making, having as partners SMS/RJ and FIOCRUZ. The project was guided by clinical experiences, health area professional researches, and meetings with patients. The study result is a 13 minutes video, where patients' speeches are mixed with scientific information. The sicken, fears and doubts, signs and symptoms, treatment and cure are described by interviewed people. A new conception of an old disease is the best lesson taken from words and smiles of those who lived leprosy. In addition it shows the solidarity of those who talk about their lives. **Keywords :** Educational video, New Conception, Leprosy.

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Stigma is an act of labeling, rejection, or unexplained fear of a person. Stigma has historically been very difficult to measure in a scientific manner primarily because of vast differences in language, geography, nuances, and culture where these actions have been conceived and blossomed. Therefore, the purpose of this presentation will be to show how, by the dearth of objection against the practice of labeling and rejection, these acts have become acceptable actions. Many laws have been enacted throughout the world which mandated the incarceration and/or isolation of persons diagnosed with, and/or suspected of having, leprosy. Also, unwritten laws—unspoken expectations—have contributed to the existence of stigma. Finally, the sarcastic and inappropriate use of offensive terminology frequently will solidify the pyramid of stigma. However, it has been the attitudes and blatant behaviors of many to focus their attention in opposite directions when rejection and labeling have been practiced. Consequently, stigma has continued, giving legitimacy to the laws of silence. Conversely, the common puzzle of humanity has the potential to assist in abolishing the laws of silence.

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Introduction : The lack of an effective therapy for leprosy treatment led the Brazilian government to adopt the policy of compulsory isolation in the beginning of the 20th century, by constructing colony hospitals in all states of the country. This abandonment and the government's disregard concerning the maintenance of those institutions, as well as the compulsory isolation policy, gave raise to serious social problems, which includes family dissolution, patients suffering from stigma, and the losing of their citizen's rights. **The purpose :** of this paper is to demonstrate that many of the problems identified inside those colony hospitals, due to the adoption of such a policy, persist to the present time. **The methodology :** comprises a bibliographical review and an evaluation of updated reports of those institutions. **The results :** show that the colony hospitals continue to present serious structural, human, and social problems, in spite of some progresses that were identified in the last two decades.

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The child rate in leprosy new cases still remain about 7 to 15 percent. It means that in previously described as endemic area and with current detection of about 1000 cases there are 70 to 150 children being detected every year. With a view to understand what happens to these unfortunate children once they are diagnosed and treated, Novartis CLC Association started the Leprosy Children Care Program – aptly described as "Looking After Future". The following statistics have encouraged us to continue this as regular activity. Total number of 87 children were examined. Ten cases (11.5 %) had thick nerves and were classified as high risk. Four (5 %) already had developed deformity. Sixteen cases (18.4 %) were having multiple patches or MB leprosy. Twenty eight cases (32 %) had definite patch and were in the category of cured patch. What was more interesting was that twenty nine cases (33 %, almost on third cases) had no sign of leprosy, meaning thereby either the patches had disappeared or something was amiss in the diagnosis. It is necessary to go in the detail of both high risk cases and the cases which had no evidence of leprosy. The social out look was represented by the fact that almost 97.7 % of these were attending the school. Not withstanding the fact that education is free, school bags were gifted to all and those in need of support for education will be identified. The human interest story in respect of one case is exemplified by the fact that on the demise of the mother, father remarried and the daughter (leprosy case) was adopted by mother's sister. She was being cared for as if she is her own daughter. NCLCA plans to facilitate her studying further.

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Introduction : The introduction of MDT has resulted into a drastic decline in both PR & NCDR with reduction in visible deformities which is the root cause of stigma. But the assembly of old and deformed cases in the colonies sustain the stigmatized social outlook and the citizens are living a poverty-stricken isolated lives compromising with human dignity. Rehabilitative measures for their mainstreaming are utmost necessary as revealed in a study conducted in 38 colonies in West Bengal and Jharkhand. **Objective :** To reveal the need, significance and impact of mainstreaming of the colonies and to develop appropriate rehabilitation measures to contribute to the national development process. **Method :** An extensive survey was conducted in 38 colonies to assess the living conditions, Socio-economic status, social outlook, educational & Training status, livelihood, social barrier, social participation and finally need of the inhabitants to bring them into social mainstream. **Result :** Five basic components for mainstreaming were found to be necessary: 1. Old-age-care-Home for old, Blind & disabled persons. 2. Vocational Training, Placement, Micro-credit & Sales networking for the productive age group. 3. Educational Assistance to students from colonies. 4. Reconstruction & renovation of houses with basic amenities. 5. Practical access to the general Health Care system. **Conclusion:** Social outlook & stigma continue till the Leprosy colonies will continue. Human dignity, economic self-reliance, productive life and education are the basic factors for empowerment which need to be ensured. Multi-sectoral involvement of the Development Agencies and the Government for effective social mainstreaming is required to meet the needs of the colony dwellers and thus to develop them as contributing.

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Every leprosy patient has equal right for access to prompt diagnosis and treatment for leprosy. In India, this is facilitated with the integration of leprosy diagnosis and MDT services available at all public health centres on par with other diseases. Although remarkable achievements are made in the epidemiological and medical spheres of leprosy elimination, the legal, economic or social discrimination and isolation resulting from physical illness or handicap due to leprosy has not received due concern. The Govt. of India also had passed a 'Persons With Disability Act – 1995', granting special concessions for the 'leprosy cured' persons including job reservations. In practical terms, this Act does not benefitted the leprosy-affected persons. In 2005, the UN Human Rights Sub-Commission has passed a resolution by expressing lack of legislative or administrative measures and appealed to end such discrimination and stigma affecting the leprosy victims. This paper will present the existing discriminatory legal provisions that are against the interest of leprosy-affected persons. Possible measures to promote the dignity and equal rights of the leprosy-affected persons are discussed. We strongly recommend that any intervention aimed to rehabilitate the leprosy-affected persons should be integrated with the general rehabilitation services. Persons disabled due to leprosy should be treated on par with other disabled for social support.

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Stigma affects the effective control of the leprosy. By understanding stigma effective measures can be designed to tackle it. A study was conducted in Khartoum, Sudan to assess the degree of perceived stigma and associated factors among people affected by leprosy. The Participation Scale was used to measure participation restriction in patients on treatment and those after completing treatment. Respondents were systematically recruited from two clinics in Khartoum for a period of two weeks. People affected by leprosy known to be living in two community areas were randomly selected into the study. The interviews were conducted in Arabic by trained interviewers and consent was obtained from all respondents interviewed. The study interviewed 68 respondents, of whom 33 were on treatment and 35 from the community after treatment. With a cut-off of 12 on the P Scale, the study found that 77.1% of respondents after treatment have participation restrictions, as compared to 15% who are still on treatment. Those restricted have similar characteristics such as visible deformities, low level of education and unemployment. Respondents on treatment show higher restriction among those with MB leprosy. It is concluded that perceived stigma of leprosy is higher among people affected living in the community with visible deformities. POD will reduce stigma. **Key words :** Stigma, Disability

Impact of Socio-Economic Rehabilitation on Leprosy Stigma in Northern Nigeria : Findings of a Retrospective Study

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This study explored the perceptions of people affected by leprosy regarding impact of socio-economic rehabilitation (SER) on stigma reduction. The study combined a quantitative questionnaire (the P-scale) with semi structured interviews of 20 individual SER participants, five focus group discussions and 10 key informant interviews. The P-scale results showed four men suffered significant participation restriction (scores > 12 points) in finding work and in social integration. The narratives of SER participants, focus groups and key informants showed that SER improved self-esteem, financial independence, acquisition of new skills, and access to public institutions. The authors speculate that through the pathway of improvements in economic and living conditions, SER is beginning to influence the process of social interaction, resulting in positive attitudinal change towards SER participants. The subjective opinions of interviewees suggest that improved self-esteem, positive family and community support for SER participants and increasing participation in community activities are indications of stigma reduction.

Social Mobilization - "A New Weapon for an Old War"

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Many strategies have been adopted worldwide aiming at controlling leprosy, which nevertheless still remains a serious public health problem in some countries. As an aggravating factor, reports and prejudiced attitudes from individuals of different segments of society persist. This fact may be related to the focus of qualifications, which are only aimed at the health professionals. Discomfort with this situation led to the search for an alternative approach, to the involvement of other partners in Control Actions. The methodology is all about mobilizing the population, especially agents who play leading roles, as a strategy for an effective social inclusion of the leprosy patient or former patient. It is believed that the population, when mobilized, will disseminate information, thus building a new social representation for the disease in addition to actively participating in the targeting of policies and actions which promote this process of inclusion. The information will also contribute to the discovery hidden prevalence, enabling, in this way, a rupture in the chain of transmission and the reduction of late diagnosis. The methodology adapted itself to different audiences, and reaffirmed the importance of Social Mobilization. **Keywords** : leprosy, social mobilization, community leaders.

In Search of Healing Springs : The Historic Bond Between Hawaii and Japan

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There has historically been a strong bond between people whose lives have been challenged by leprosy in Hawaii and Japan. In the late 1800s and early 1900s this centered around the search for a cure, that led people to the Kusatsu Hot Springs. People traveled long distances to bathe in these healing springs. Treatment often included being punctured with 300 heated needles before bathing. It was painful, expensive and often discouraging. In the 1880s, the Goto Bath treatment was introduced to Hawaii and for more than 20 years remained the treatment of choice for the people of Kalaupapa. In 2007, family members of Kalaupapa residents joined residents of Kuriyu Rakusen-en Sanatorium to visit the grave of Kaoru Shukuzawa from Hawaii who had made the long journey to Kusatsu in 1914, dying there in 1926. The modern-day bond between Hawaii and Japan centers around a deep and vital understanding that no treatment, no cure, is complete unless it is accompanied by a restoration of the family ties that were severed in the days when there was no cure. **Key Words** : Human rights, discrimination Stigma, Social Aspects, Restoration of Family Ties.

O-277**CLEAR-IDEA Rotary Programme : Experience of Self Empowerment****MS Rajagopalan, Muthusamy, Shankamarayan and PK Gopal**

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It is a unique Project by Rotary Dist.3200 Established in 1999 for Physical and socio-Economic Rehabilitation of leprosy affected person and their children. This Project could be implemented by Rotary Clubs worldwide to help Leprosy affected person and their children. By this Project we have been able to transform lives of leprosy affected person and elevate them from below poverty status. The first aim was to educate their children and prevent dropouts due to lack of finance and also to prevent child labor. I. Educational Scheme: Many of their children's lives have been transformed and they have become software Engineers, Doctors, Nurses, Paramedical workers and Vocational training in Electrical and Mechanical. I. Socio Economic Rehabilitation a) Micro Credit: By giving Micro-Credit without interest rate, we are able to prevent them from falling into the clutches of money lenders with exorbitant interest rates. b) Sanitation and Hygienic: By providing Bore wells, Hand pumps, Bathroom and Toilets, their life conditions have improved. c) Low cost House: Low Cost Houses have been provided in collaboration with Govt. schemes. II. Physical Rehabilitation: a) Reconstructive surgery, Intra ocular lens (IOL) implementations have done for affected person.

O-278**Increased Voluntary Reporting of Leprosy Cases with Special LEC Campaign After Integration – GLRA/ Swiss Emmaus India****Shibu George¹ and Thomas Abraham²**¹GLRA/SWISS EMMAUS India, ²Gajapathy Street, Shenoy Nager Chennai 600030, India

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Introduction : Leprosy is associated with stigma and erroneous beliefs in the minds of people. IEC can bring lasting changes in the beliefs and attitudes of the people. After integration awareness building was given top priority to promote self reporting of leprosy cases. The national statistics shows that currently more than 150,000 new leprosy patients are registered annually in India. German Leprosy and TB Relief Association & Swiss Emmaus, two International Organisations working in India for more than 50 years, carried out extensive IEC campaigns on Leprosy in selected pockets of 26 districts, especially the geographically difficult terrains in collaboration with the respective District Health (Leprosy) authorities. **Methodology :** Three remote PHC's were selected in each districts covering on an average of 1 lakh population in 4 days time. Detailed orientation on leprosy and IEC method was given to all participants and empowered them on better communication skills. Each worker visited around 100 houses / 300 persons every day and educated them on leprosy through Inter Personal Communication (IPC). Distributions of pamphlets on leprosy, public mike announcing, displaying banners were few other tools used. A total of 96 staff including 3 Medical Officers, 8 supervisors and 85 volunteers (General Health staff, ICDS workers, Nursing students and local NGOs) involved in each campaign. **Results :** During the campaign 527,885 houses were visited and 2,578,270 people were educated on Leprosy. 2997 suspect persons were referred to the nearest Health Centres for diagnosis and management. Among them 752 new leprosy cases were registered including 117 children. After analysis it was noted that the new case detection had gone upto five fold compared to pre campaign case reporting. This trend was similar in all districts. **Conclusion :** By IEC Voluntary Reporting of new suspects increased. The campaign facilitated training of General Health Staff. More number of special IEC programmes should be encouraged in remote & difficult to reach areas to enhance self reporting of new leprosy cases.

O-279**Concerns Affecting Younger Women in Eversley****Angelina P Rivera**

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Life of younger women affected by Hansen's disease can be truly harsh, impacting us socially, physically, mentally and spiritually. It involves painful separation from family and friends; it gives many younger women sleepless nights. It somehow created so many questions in our minds—why things happened this way; why we got this disease; what have we done wrong. We understand that there are medical programs for people affected with the disease; we understand the efforts of social workers, health workers and other professionals, but still the socio-psychological aspects of Hansen's disease brought into our lives, is dreadful at times. While younger and still new to Eversley and taking MDT, we were taught how to take care of ourselves; we have participated in youth leadership training, in addition to learning in school. Four younger women have received scholarships to attend school. In spite of the stigma, we are still hopeful that a brighter future awaits us if we, the younger women, accept that there are things that we cannot change, but we being young can do something to make a difference. **Key Word :** Stigma.

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Discriminatory Law Against People with Leprosy : Barrier Towards Integration of People with Leprosy into Society

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All discriminatory laws introduced during the medieval period are still in force. These laws were introduced to prevent common people from transmission of disease. During the Rana regime two leprosariums were established in Nepal- one in Khokana close to Kathmandu and another in Malunga about three hundred kilometers west of Kathmandu. People affected by leprosy were forced to stay in the sanctuary and not allowed to leave the institution. The discriminatory law permits one to seek divorce from one's spouse on the grounds that their spouse has leprosy. If the wife has leprosy, the degree of discrimination is doubled. She is forbidden to seek support for her life from her husband. This disease was placed into the category of dreadful and highly contagious diseases by law. Interaction with persons affected by leprosy in public places was forbidden. Today this serves as the basic reason behind discrimination against people with leprosy. This status has prevented affected people from integrating into their community. **Key Words** : Human rights, discrimination.

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Retrospective Cohort Study on Social Status and Family Acceptance Before MDT, at RFT and After RFT

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Leprosy is a biosocial disease. Effective Management requires not only cure and prevention of physical disabilities, but a concern and action to prevent social problems. Being a stigmatized disease, it is necessary to monitor the changes in social status and family discriminations while on MDT. A study was done at 102 leprosy patients who completed the prescribed course of MDT at our referral hospital, comparing their status before MDT with the situation at the time of release from treatment (RFT), and assessing their current status. Family acceptance changed from 92% before MDT to 86% at RFT, and further declined to 73% at present. Community acceptance also declined from 95% to 88% to 77%. Self-esteem seems to have increased and the patients' social withdrawal increased from 19% to 28% to 34%. Desire to live and accomplish something remained the same. The patient's body image showed significant improvement. These changes are studied by age, gender, type of leprosy and disability status. Health services must take more responsibilities to care for the leprosy patients holistically, and ensure that debilitation and loss of self-esteem does not occur. **Key words** : family acceptance, social status, leprosy.

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Empowerment Through Education of Children

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Children are the promise of humanity for tomorrow. Education plays a pivotal role in the growth and development of any society and nation. The persons affected by leprosy were thrown out and used to settle down by themselves and families in exclusive colonies. The children of leprosy patients as well as those affected by the disease needed financial support to pursue their education. Due to the difficulties in finding resources they used to drop out from places of education. To overcome the above scenario IDEA India had launched an educational support programme and supported over 1300 children hailing from 58 patients' colonies in the state. Many children who had completed their education were placed in good jobs after training. Various educational support rendered through IDEA India have been helping to empower the families of those helped to improve their living conditions and to re-establish themselves like any other. Providing education to the future generation is a genuine need and desire of human society. It is natural for a human being to want to be a human being and fight for his right to exist with dignity. The children of leprosy patients and those affected by leprosy are no exception in this regard.

Impact of Housing in Leprosy Stigma Reduction

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In order to assess the impact of low cost housing to the leprosy patients on reducing the impact of stigma against leprosy, a survey was conducted on 30 beneficiaries, who were assisted in building permanent houses under the Low Cost Housing project of The Leprosy Mission and the results were presented here. Data were collected by interview through structured questionnaire. All the beneficiaries of 'Low Cost Housing' project are visibly deformed, and live in rural community. The average family size is five. 92% of the beneficiaries are living in new houses for more than two years. Before permanent houses were built, all were living in thatched houses and 65% of them expressed that they were ignored by local community, not invited/accepted in social gatherings in the neighborhood and similarly, the community members avoided visiting these families. Only 19% of those who had stigmatized experience said that they themselves had a feeling self-stigma and did not invite others into their homes. After started living in newly built better houses, 96% of the beneficiaries experienced that there has been change in the attitude of the community, which was evident as the family members are being invited for social functions by the community members. **Key words** : housing, stigma reduction.

A Study on the Prevalence of Stigma Related to Leprosy, HIV/AIDS and TB Among School Students in India and the Effectiveness of the Methodology to Reduce Stigma

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Introduction : The goal of the study is to gauge the extent of prevalence of stigma about Leprosy, HIV/AIDS and TB all being stigmatized diseases on a much larger scale than the originally believed. Based on the analysis of the study it was proposed to reduce the stigma against these diseases through intervention stigma reduction programs, thereby paving the way for acceptance of disadvantaged persons and communities enabling equal opportunities for them in society. **Methods** : A multi centric, cross sectional, representative study was carried out through questionnaires. Students in the age groups 12 yrs to 17 yrs both boys and girls from Government and Private schools studying in the 7th to 12th standards from 30 districts comprising 14 states of India in both rural and urban centres. **Results** : With regard to individual diseases, 89.6% of those surveyed registered an overall increase in knowledge about leprosy with 8.1% registering a very significant increase. The figures stand at 89.4% for HIV/AIDS and 91.0% for TB. 84.7% surveyed had reduction in perceptions of stigma related to these diseases. **Conclusions** : The positive results showed that the program has been hugely successful in increasing awareness levels and in reducing levels of stigma.

Self Help Groups of the Persons with Disability - An Agent of Change

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Need for the study : Any developmental activity should bring in some change. This project strives to bring change in the lives of people with disability in terms of Socio-Economic status, quality of life of the members of the Self Help Group. **Conclusion** : The members of the Self Help group get more social acceptance than before. They have gained self esteem. They have savings in then bank which gives them some security. They have more access to the bank than the able bodied. They are aware of their rights and the Government benefits and how to access them. However the members lack vision which needs to be developed. **Key words**: self help groups, self help in disability.

Micro - Credit as an Effective System to Improve the Quality of Life of Leprosy Affected and Other Disabled People in South India

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Introduction : Due to disabilities and reigning beliefs, most of the leprosy affected and other disabled people are unemployed and have a very low standard of living. Only about 2% of the disabled people in India receive the aid to which they are entitled. The Micro credit system has been tried to improve the ability of the disabled individual to achieve social security and decrease their vulnerability. **Methods :** Development activities were carried out in 2 rural and 2 urban districts. Financial group work through micro credit was employed and both economic improvement and social acceptability were assessed. **Results :** 76.75% participants reported increased financial capacity and 88.84% achieved greater social acceptance. Other benefits included improved awareness, upliftment of the status of women and better control over decisions that affect their lives. There was reduced dependence on money lenders and non institutional sources. **Conclusions :** Holistic, sustainable and integrated development of human life and social acceptance was achieved through this system by better attention to the special needs of the disabled. **Key words :** Micro credit system, disability, social sciences.

Needs and Quality Care Issues of Women with Leprosy

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Introduction : Given the gender inequalities, leprosy affected women are likely to report late and default more during MDT. In order to determine to what extent women leprosy patients needs and expectations are fulfilled a study was done at a Leprosy referral hospital in Kolkata. **Methods :** All women leprosy outpatients (104) were interviewed and physically examined. **Results:** 46(44%) were below 40 years of age. 17 (16.3%) were unmarried, and 13(12.5%) were separated/divorced. 30% were illiterate. 63% belonged to poor socioeconomic status. 44% came alone, 30% were brought by father/husband. About 93% had leprosy related problems. Nearly 60% already had visible disability. For 90% of patients, this was a visit for recurrence of complications. Almost all patients expected medical treatment as well as self-care skills. 25% were still ignorant of the early signs, causation and spread of the disease. Nearly 60% preferred to hide their disease. The need for repeated visits to the hospital was very difficult in terms of cost, time away from responsibilities at home. **Conclusion :** Effective treatment though available, is often not accessible, especially by women, partly due to distance, transportation cost, domestic responsibilities and not having the power to make health decisions themselves. An aspect of quality care often neglected in practice, is lack of privacy for women during history taking and examination, toilets and separate waiting areas. **Key words :** quality of care, women with leprosy.

A Study on Community Based Approaches for Reducing Leprosy Stigma : Community's Perception

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Reduction of stigma against leprosy has traditionally been attempted through IEC methods along with leprosy control work. As an attempt to develop innovative strategies of leprosy stigma reduction by community action, a survey was conducted with one of the main objectives to assess people's suggestions and preparedness towards community based stigma reduction programmes is one of the main. Nearly 2,400 community member (heads of households) and 600 leprosy patients were interviewed. Further, 60 key informants were interviewed in depth and 100 focus group discussion were held in the three states viz. West Bengal, Uttar Pradesh and Chattisgarh. The results suggested some interventions such as organizing village level meeting in which leprosy patients also participate, Health camps in the village where leprosy patients as well as other are treated together and the villagers could observe the normal behavior of doctor with the patient, Cultural programs through folk song and folk dances like chhou, baul, jhumur for leprosy awareness, Common feast be organized during any local fare where patients will serve food and Public garden maintained by the leprosy patients etc. Generally, there was a favorable attitude towards reducing leprosy stigma and communities are enthusiastic to take initiative in the above programmes. **Key words:** community based approaches, reduction of stigma, community and stigma.

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Since 2001 The Leprosy Mission evolved a practical community based integrated development module leading from an institutional model to a community based model and finally to a programme entitled "from Margin to Mainstream". Nearly 46168 persons with physical and social disabilities have been helped through counseling, provision of assistive devices and development of skill as well as placement in economic activities. During 2006 – 2007 the programme has taken a more concrete shape involved actively several communities including slum population in Delhi. A major initiative was taken towards capacity building which included training on community development, exposure to community development activities and establishing of linkages through awareness generation. Details of inputs, processes, outputs and outcomes are presented with discussion on future lines of action. It is concluded that specific capacity building and involvement of critical groups in the community such as youth and women contribute significantly to the transition from margin to mainstream and from dependency to freedom. **Key words:** integrated development, development in leprosy.

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Non involvement of community is probably the significant reason for little change in leprosy stigma even after decades of leprosy control work. A survey was conducted in the three states of West Bengal, Uttar Pradesh and Chattisgarh, with the specific objective of assessing community's perception towards community based action towards leprosy stigma reduction. Data collected from all the three states emphasized formation of village committees in each village. Interaction of trained social workers placed as Community Organizer to facilitate the community-based action, as per their perspective, lead them in forming a Stigma Reduction Organizing Committees (SROC) in each village. Thus a total of 60 SROCs were formed from three states. Experiences of forming SROC in different states suggest that a successful working committee must have their native leader/sarpanch as chairman and consists of 12-20 members with representation from females and various castes, formally meeting twice a month in the presence of chairman. Most of the SROCs, as per their plan, organized health/skin camp in their own villages to establish better rapport with the community and some of the SROC members visited TLM hospital to get educated about leprosy to enable themselves organize community-based action programmes for leprosy stigma reduction. **Key words :** village committee, stigma reduction in leprosy, village participation in stigma reduction.

IEC - a Methodology in Leprosy Elimination Tamilnadu Experience

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Tamilnadu, a southern state of India has a population of 661.67 lacs (March 2007) with an area of 1,30,058 sq.km. It is one of the front-runners in Health indicator and infrastructure in the country. Leprosy has always been a disease of high prevalence in Tamilnadu (118/10,000-May 1983). It gave birth to the SET/LCU Programme in 1955 as the State National Leprosy Control Programme. Dapsone mono therapy was introduced in Tamilnadu in 1940's, when the prevalence of Leprosy was very high. Multi Drug Therapy (MDT) was introduced in phases in all the districts of the State between-1983 and May 1991 when the State had a prevalence of 118. Elimination was achieved at the State level in March 2005 and at the District level March 2006. It is working towards the block level elimination by 2012. General Survey, School Survey and Contact Survey were the main tools for detection and diagnosis of Leprosy in the community. Awareness was generated by the Health Education through the Leprosy Health providers. With the integration of the Programme in State into the State Public Health System in July 1997 the vertical programme was disbanded into the District Programmes. A pan-state IEC Programme was conducted by the State Govt. Health Department, DANLEP, N.G.O's and peoples participation to increase the awareness of Leprosy. This has resulted in an increase in the Voluntary Reporting of Cases. The figures are given below:

District & Block PR Range of Tamil Nadu as on Mar 2005-2007
No : of Revenue Districts – 30 No : of Blocks – 385 PR Range as on 31-03-2005:

PR Range	<1	1.1-2	2.1-3	3.1-4	4.1-5	5-10	Total
District	22	8	0	0	0	0	30
Block	296	74	13	2	0	0	
PR Range as on 31-03-2006 :							
PR Range	<1	1.1-2	2.1-3	3.1-4	4.1-5	5-10	Total
District	30	0	0	0	0	0	30
Block	329	52	4	0	0	0	385
PR Range as on 31-03-2007							
PR Range	<1	1.1-2	2.1-3	3.1-4	4.1-5	5-10	Total
District	29	1	0	0	0	0	30
Block	356	29	0	0	0	0	385

The District wise figure indicating the Voluntary Reporting rise will be presented in the paper. **Key words :** Prevalence, elimination, integration, awareness.

High Degree of Social Restrictions in a Former Leprosy Colony, Ceara State, Brazil

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Throughout history, leprosy patients have been suffering not only from physical disabilities, but also from social exclusion. This study aims to measure the social restriction perceived by ex-leprosy patients residing in a former leprosy colony in Redenyo Municipality, Ceara State (North-East Brazil). We used Van Brakel's Participation Scale, an interview-based instrument assessing client-perceived social participation on a score system (0-90 points). It is used in leprosy patients, but has so far not been applied in a former leprosy colony. We obtained data from 77 (85,6%) of the 90 leprosy-affected residents of the colony who have been successfully treated. In total, 52% showed social restrictions, indicated by a score > 12 points. Restrictions were mainly related to working and travelling and less common in activities in the closer community. Social participation was significantly lower in individuals with mobility restrictions ($p < 0.001$), and visible deformations ($p = 0.01$). The perceived restriction of social participation is an important consequence of leprosy among the population of a former leprosy colony in North-East Brazil.

Free Papers - Psychosocial Aspects

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Assessment of the Depression Among Leprosy Affected Subjects Using Three (3) Depression Measurement Scale

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Introduction : In leprosy affected subjects, it is possible to develop depression due to stigma, fear, disability. Hence there is a need to assess the levels of depression using the various scales available for this purpose. **Methods :** A sample of patients affected by leprosy and their close relatives from the leprosy projects managed by LEPRA Society were selected. Three Popular scales for assessing depressions were used on the subject. Simultaneously participations scale and SALSA scale was also noted for some of the subjects. **Results :** The analysis of data based on the depression scale and prevalence of depression in subjects affected by leprosy and some of their close relatives. This data will be correlated with participated scale which assess in directly the stigma and SALSA score which assess activity limitation for knowing the possible role of stigma and activity limitation in the development of depression. **Key words :** Leprosy, Depression, Depression scale, Stigma, Activity limitation.

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A Study on Psycho - Social Barriers in Practicing Self Care Among Leprosy Affected People

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Introduction : Factors that have been suggested for contributing to leprosy stigma includes deformities, which also affects the psychological well being of the patient. Self-care plays a vital role in the prevention of deformities. However, little is known about the self-care barriers of patients with leprosy. The objective of the study was to identify perceived barriers in practicing self-care activities among leprosy patients, at personal, family and community level. Descriptive research design is used for the study. **Methodology :** A questionnaire on barriers in self care was developed based on the responses collected from patients by the free listing technique, about the barriers perceived by them in different areas. **Conclusion :** Analysis reveals barriers to self-care, including effects of dominant individual conditions such as depression, anxiety, fear, guilt & shame and other factors such as lack of financial, family, community and emotional support. The results suggest the need for an intervention with a comprehensive team approach to self care which includes increasing emotional and family/ social support through counseling.

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When is Psychological Support Necessary for People Affected by Hansen's Disease ?

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When I rented a small house in the town of Corumbá, I was asked to leave after only one day because I put up a poster saying - Hansen's disease has a cure. I saw fear in the eyes of the family who had rented the house to me — fear that the place was stigmatized. This made me think about how the population of Corumbá feels about Hansen's disease. Research was carried out to investigate the attitudes of the population of Corumbá towards Hansen's disease. We focused on three categories of people: a) those who never had Hansen's disease; b) those who have had Hansen's disease, are without disability and have been discharged as cured; c) those who were undergoing treatment. The findings indicate two common feelings: fear and the lack of realistic concepts with regard to Hansen's disease. There were imaginary and real fears. The feeling of fear provokes instability in the emotional state of people. It brings insecurity and self-segregation. How do we help people overcome fear? How do we assist people who say "With Hansen's disease, something died within me"? How do we create conditions whereby people can cope with fear, prejudice and stigma? **Key words :** Psychological Support, Fear, Prejudice.

O-296**Stress as a Correlate of Self Care Habit of People Affected with Leprosy**Kumbhakar R and Nanda RK

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People with anesthetic feet are often at risk of developing planter ulcers. Therefore, learning of good self care habits is one of the most effective ways of prevention of ulcer formation and/ or its recurrence. Although these practices seem simple and easy in a community setting, the fear of rejection and discrimination due to the stigma of the disease causes more stress than the disease. This study therefore has been designed to establish a correlation between stress and self care habit of an individual affected with leprosy. This was done in 105 patients from the out patients department and for inpatients of the Leprosy Mission Hospital in Purulia. The patients were divided into 3 groups of 35 patients each and the last group comprised those who had more than 3 episodes of ulceration. The results will be presented for the conference. **Key words** : recurrent ulcer in leprosy, stress, causes of recurrence.

O-297**A Study on Counseling Needs of Leprosy Patients at
A Referral Hospital in Uttar Pradesh, India**Bense Neelmani

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Introduction : Leprosy is still most stigmatized. Further, some patients continue to have recurrent, serious complications e.g. reactions and ulcers leading to socioeconomic losses. In practice, leprosy patients are given medical treatment but not counseled adequately. **Objective** : To determine the counseling needs of leprosy patients newly diagnosed or during treatment for recurrent complications. **Methodology** : 50 patients newly diagnosed to have leprosy and 50 patients with chronic reactions or ulcers admitted in the hospital were studied through in-depth interviews. The counselor subjectively assessed the need for follow up counseling for those who had significant problems. The data were analyzed using computer. **Results** : Over 90 per cent had poor knowledge of leprosy. More than 80% of patients had wrong and negative perceptions of leprosy. They had poor acceptance of the disease and had anxieties and fears of loss of self-esteem, socioeconomic problems. More than half were depressed. A few also had suicidal ideation. Almost all expressed satisfaction with the counseling, and a majority wished to have follow-up sessions to cope with their problems. **Conclusions** : Counseling should be an integral part of leprosy care to ensure better acceptance of the disease and to cope with psychological and social problems. **Key words** : Counseling needs, leprosy

O-298**Concept Note on Behaviour Change Communication (BCC)**Vincent Victor and PSS Rao

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Behaviour Change Communication (BCC) makes use of mass media, new technologies and creative ideas in communication to influence social behaviour change towards a positive life. BCC has evolved from information, education and communication (IEC) programmes to promote more tailored messages, greater dialogue and fuller ownership. The variables that contribute to behaviour are far more difficult to change than simply improving one's knowledge or increasing awareness about a particular issue or concept. Communication for behaviour change often involves reaching out to marginalized populations whose needs and behaviours are different from those of the rest of the community. TLM has been delivering BCC in its training programmes provided to volunteers via inter-personal communication conducted by Media Centre for some of its programmes so as to make the intervention more effective in contributing towards wider reach and acceptance. It has been observed that the volunteers have been able to mobilize the target audience through effective IPC and bring about changes in the socio-economic status of individuals and families (afflicted by disability caused by leprosy). **Key words** : behavioral changes.

Poster Presentations Clinical Aspects

P-1

Role of Protein in Leprosy

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The paper presents the role of protein in leprosy based on the survey conducted in four districts of Madhya Pradesh (Barwani, Jhabua, Khargone and Khandwa) to correlate with protein intake. The above four districts have been supported by the Technical Support Team. During the survey and case validation a total sample of 350 leprosy cases have been studied. The study has closely observed and studied the intake of proteins by the sample group. The main findings of the study has revealed that 90 per cent (313) of the total sample were from the low socio economic group, 8 per cent of the sample (28) were from middle class and the remaining 2 percent (9) were from high socio economic group (4) and Muslim community group (5). An analysis of the above findings clearly indicates that leprosy occurs mostly in low socio economic group of community where there is very less protein diet is taken. On the other hand, people of high socio economic group and Muslim community have reported to have less number of leprosy cases with only 1 per cent each. This in turn reveals that the intake of protein is good in high socio economic group and Muslim community.

P-2

Clinical and Histopathological Comparison of Monthly ROM Therapy with Standard WHP MDT PB and MB in 1-3 Leprosy Lesions

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The operational convenience and drug compliance with ROM therapy, a one dose regimen, offers the attractive alternative in treating leprosy patients. Aim: To evaluate the efficacy of monthly ROM in patients with 1-3 leprosy lesions. **Materials and Methods** : 66 patients with 1-3 lesions were included in the study. Patients were divided into three groups. One group received monthly ROM for six months. The other two groups received WHO standard PB and MB regimen for six months. At the end of six months the patients were evaluated both clinically and histologically. well defined parameters were used to measure clinical and histological resolution. With single lesion 10 out of 14 patients showed marked improvement. In patients with two lesions grade II resolution was seen in 8 out of 10 patients and four patients received ROM therapy. Among 16 patients with three lesions 4 patients with ROM therapy showed marked improvement. Overall assessment showed that out of 22 patients 18 patients showed clinical improvement and 100% showed histological improvement at the end of six pulses. **Conclusion**: Monthly ROM therapy is ideal for single leprosy lesion, as effective as WHO MDT-PB or MB in patients with two or three lesions.

P-3

Low Prevalence of Relapse After MDT

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Response to multidrug therapy (MDT) is usually efficient for leprosy treatment and avoids *Mycobacterium leprae* resistance. However, some cases have recurrent lesions following release from MDT. A longitudinal study of leprosy patients, initially diagnosed between 1987 and 1997 at the Leprosy Clinic, FIOCRUZ, Rio de Janeiro, was performed in order to evaluate the incidence of relapse until 2006. Relapse was defined for patients that had completed a course of WHO-MDT or ROM, and further developed new skin or nerve lesions and/or had reactivation of old lesions, after a symptom-free period. Out of the 1203 patients, 598 (49,7%) were treated with 24 doses of MB regime, 589 (49,0%) with 6 doses of PB regime, and 16 (1,4%) with ROM. After an average of 7.5 years (3-14 years) of follow-up, 16 patients had relapse, resulting in a rate of 1.3. The relapse rate remained about the same, 1.15, when only the high BI patients (BI $\geq$ 3) are considered. However, if the PB patients treated with ROM were excluded, the relapse rate is reduced to 0.76 (9 in 1187 patients). Thus, MDT has proven effective in our group of patients, in contrast to ROM which seems insufficient. **Key words** : MDT, ROM, relapse, treatment.

P-4**Effect of Corticosteroid Usage on the Bacterial Killing, Clearance and Nerve Damage in Leprosy; A Prospective Cohort Study. Part I) Baseline Observations in 400 New MB Cases**

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Objective & methods : To investigate adverse effect/s if any of the therapeutic usage of corticosteroids (Prednisolone 40 mg tapered to 5 mg over 12 weeks given to treat reaction/neuritis) on killing and clearance of bacteria, granuloma clearance and the resultant nerve damage. We describe here the baseline clinical, histological, bacteriological & nerve function assessment findings of 400 untreated MB cases, with special emphasis on differences between cases presenting with and without reactions/neuritis. **Results :** At base line, using Ridley Jopling classification, 39% of cases conferred to BT, 20% BB, 36% BL-LLs and 5% were pure neural cases. Overall 60% of cases were slit skin smear negative. 33% of them presented with deformity, either grade 1 or 2 of which, majority (82%) had DG2. Ulnar claw was the most common deformity. By MNP, 85% of cases showed one or more thickened nerves. Assessment with MF and VMT combined tests showed abnormal nerve functions in 49%, while SNCV / MNCV were abnormal in 92% of cases. Sural and ulnar (motor) nerves were most frequently and severely affected. Overall 140/400 (35%) cases presented with reaction of either type, of which majority 107/140 (76%) had T1R with/ without neuritis, T2R with/without neuritis was seen in 8 (6%), while only neuritis in 25 (18%) cases. On comparing cases presenting with (Gr.A) and without (Gr.B) reaction/ neuritis, the incidence of DG2 was significantly higher in Gr.A (39%) as compared to Gr.B (20%). By clinical tests, % of cases as well as nerves showing abnormal nerve function was significantly higher in Gr.A. On the other hand in the more sensitive NCV test, number of cases showing abnormal SNCV / MNCV parameters were closely comparable in 2 groups i.e. 94% & 91% in Gr.A and B respectively but in terms of number of nerves it was higher in Gr. A. **Conclusion :** At baseline neuropathy / involvement of peripheral nerve trunk/s was detected in almost all the MB cases regardless of reaction, the difference being the more severe and extensive nature of nerve damage presented by cases with reaction/neuritis. **Key words :** Leprosy, baseline data, corticosteroids, nerve damage, reaction.

P-5**Relapse in MB Leprosy After One-Year WHO-MDT**

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This study aimed to determine the frequency, time interval to relapse and the possible risk factors for relapse in MB leprosy after one year WHO-MDT. MB leprosy patients treated with one year WHO-MDT were recruited and monitored for signs of relapse. Criteria for relapse include the appearance of new/active lesions and an increase in BI of at least 2+ at any site. The majority of the 300 patients recruited were of the more severe type of leprosy with an initial average BI of 4+ and above. Patient follow-up ranges from 1-7 years after MDT. Average follow-up was 3.5 years for a total of 1,059 patient-years. So far, only one patient relapsed 7 years after treatment. This patient had a high pretreatment BI but attained a few years of smear negativity before relapse. This particular case of late recurrence suggests the possibility of relapse due to persisting organisms. Also, this finding seems to support earlier reports that a high initial BI remains as an important risk factor for relapse. However, smear negativity after treatment does not necessarily protect a patient from eventual relapse.

P-6**The Possibilities of Usage of Horseradish Root Containing Peroxidase and Galoids in Leprosy Therapy**

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The aim : is on the basis of experimental leprosy (by Shepard) to activate antimicrobial action of myeloperoxidase (MP) system phagocytes by introduction to mice the horseradish root (HR) having peroxidase in complex with galoid (iodine, bromine). **Methods :** mice of CBA line, infected by *M. leprae*. Various doses of KJ and KBr were tested. After infection mice were given food having effective antibacterial dose (300 mg/ kg food) melted HR with active peroxidase 100 E/g. and KJ and KBr daily. **Results :** the treatment by HR in combination with KJ and KBr in doses 0,2-0,4 and 0,1-0,2 mg/kg of animal mass leads to decreasing of *M. leprae* in mice foot pads in comparison with control group (mice without treatment), and increase of antimicrobial effect and growth of activity of MP in blood neutrophils of mice in comparison with DDS treatment. **Conclusion :** the method of complex therapy of leprosy patients may be worked out on the basis of this investigation. **Key words :** experimental leprosy, treatment.

P-7**Effect of MDT on the Oxidative Status of The Body**Chandna R¹, SN Bhattacharya², A Singal² and SK Tripathi³¹TLM, Research Resource Centre, Noida, UP., ² Department of Dermatology, UCMS and Guru Teg Bahadur Hospital, Delhi., ³ Department of Biochemistry, UCMS and Guru Teg Bahadur Hospital, Delhi, India

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Introduction : The three drugs comprising MDT have differing natures at cellular level- clofazimine is pro-oxidative while dapsone and rifampicin are anti-oxidant. This study was designed to determine the cytological effects of these three drugs when used together as standard MDT. **Methods :** Two groups- MB and PB were created and 30 patients completed the study in each group. The level of oxidative stress in the patients' serum was determined by three tests-FRAP (ferric reducing antioxidant patients) a measure of total plasma antioxidant potential, glutathione levels (a normal plasma antioxidant) and malondialdehyde – a marker of cell damage due to oxidative stress. These tests were performed before starting and after three months of MDT.

Results : The levels of oxidative stress were significantly higher in MB as compared to PB before initiating MDT. After three months of therapy, there was a significant reduction in malondialdehyde levels and the levels of FRAP & glutathione were found to improve. **Conclusions :** Despite the difference in the individual nature of these three drugs, when combined as MDT they play an antioxidant role and help in the reduction of free radical damage at cellular levels. **Key words:** oxidative stress in leprosy, effect of MDT on oxidative stress, oxidative stress and leprosy.

P-8**Safety of Anti-Leprosy Treatment [ALT] During Pregnancy : An Observation at an Outpatient Facility in Barabanki Uttar Pradesh**

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Introduction : MDT is given to all those self-reporters diagnosed with leprosy, 40% of them are women. **Methods :** Women registered for MDT were screened for pregnancy by counselor and nurse. Those that are found pregnant were given an antenatal check-up and counseled. They were followed up regularly during and after MDT. Data collected from patient charts, counselor's record and prenatal check up forms, compiled analyzed and reported. **Results :** Among 500 average annual self-reporters diagnosed with HD requiring ALT [MDT], 40% of them are women come from rural areas. About 10% of these were found pregnant during MDT. They belong to 19 -30 age group, primary education one high school and another university graduate. They live in joint family households. Their pregnancies were detected from gestational ages 3 – 7 months. All of them delivered healthy babies during or after MDT. All of the married women live with their husbands in a joint family. They overcome with fear of disease, added with pregnancy it becomes fear and worry. Many have fear of hurt, rejection of self and baby. All of them needed assurance and support, especially that of a female. **Conclusion :** This study shows and reinforces that it is absolutely safe to give MDT during pregnancy. Counselor's and Nurses' supportive role plays a significant role in removing fears, anxieties and worries for pregnant women patients. **Key words:** safety in pregnancy, MDT.

P-9**Can MDT Reverse the Neutrophilic Anergy to *M. leprae* ?**Chandna R¹, Bhattacharya SN², Singal A² and Tripathi SK³¹TLM, Research Resource Centre, Noida, UP., ² Department of Dermatology, UCMS and Guru Teg Bahadur Hospital, Delhi., ³ Department of Biochemistry, UCMS and Guru Teg Bahadur Hospital, Delhi, India

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Introduction : In this era of elimination of leprosy, the reasons for relapse have gained significance. One such mechanism of persistence of *M. leprae* in the body is the anergy of neutrophils to the bacterium. The failure to become sufficiently activated or the complete unresponsiveness of macrophages to activation signals of *M. leprae* could allow the bacteria to escape destruction and increase the chances of a relapse. Since all three drugs used in MDT have some effect on neutrophil activation, this selective anergy might be reversed to further the eradication of the bacterium. **Methods :** Neutrophil function was determined in MB and PB patients by the production of superoxide ions and the nitroblue tetrazolium reduction test. This was performed prior to the start of MDT and after three months of therapy. **Results :** The levels of these markers were significantly lower in MB as compared to PB. After three months, neutrophils showed significantly increased levels of activation in both groups. This rise was greater in MB patients as compared to PB. **Conclusions :** MDT can improve neutrophil function and reduce the chances of a relapse in leprosy. **Key words :** neutrophil function in leprosy, MDT and neutrophil function.

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Type 2 reaction in leprosy causes disability and suffering in at least 10% individuals with multibacillary leprosy. Prednisolone is effective and safe for controlling reaction in the majority of cases, but a minority need alternative or supplementary drugs. Leukotriene inhibitors have been used "off label" in a small series of cases with good effect. With patients' verbal informed consent, we gave zafirlukast or montelukast to selected patients suffering type 2 reaction who had contra-indications to prednisolone or adverse effects of steroid, when standard second line drugs were inappropriate or unavailable. Outcomes were recorded subjectively: patients self-reported well-being, dose of prednisolone needed to maintain control of reaction, and reduction in admissions. Amongst ten patients treated with Zafirlukast or montelukast at DBLM hospital over 2 years, eight experienced definite benefit without adverse effects and only one suffered mild adverse effects. A small scale formal trial comparing leukotriene inhibitors with standard steroid treatment for type 2 reaction is now underway. **Key words:** ENL, Type two reaction, steroid, second line drug, leukotriene inhibitors.

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Understanding the pathogenesis of reactions has helped in the selection of drugs for treatment, such as thalidomide, the primary treatment for erythema nodosum/multiform. However, due to its teratogenic effects thalidomide cannot be used in fertile women. In addition, leprosy reactions frequently recur or are resistant to treatment. In order to evaluate the effective use of thalidomide for treatment of leprosy reaction, the files of 145 patients exclusively treated with thalidomide at the Leprosy Outpatient Clinic, Oswaldo Cruz Institute since 1990 until 2006 were evaluated. Only 43 patients had standard thalidomide treatment for up to 3 months and 59% of the patients had more than one episode. Out of the total of 245 episodes evaluated, 70% required more than 3 months treatment. Mean duration was 7 months, but in some patients reaction lasted more than 30 months. Severe episodes were found to be a risk for having prolonged and/or recurrent reactions (RR=1.23; CI= 1.02-1.48). The long duration of treatment observed indicates the development of refractoriness to thalidomide in a large group of patients. Thus, there is need to explore new immunosuppressive agents for treatment of recurrent or resistant leprosy reactions.

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Introduction : BOLEP is a LEPRA Society project started in 1991 for leprosy services and covers the entire Subarnapur district with a present population of 5,78,932. Till the integration in 2001, it has under taken regular activities like implementation of MDT and complication management in leprosy. All the cases were subjected for skin smear examination and the results were graded in the Ridley scale. **Methodology :** It is a record based study from the data of 1991 to 2001. During the period a total 22,075 leprosy cases were detected of which 6270 (28.4%) were MB type. Among these MB cases, 1990 (31.7%) were smear positive. Among these positives, 129 (6.4%) suffered from ENL. The data of these 129 cases was analysed. **Results :** Among the 129 ENL cases 98 (76%) are LL and 31 (24%) are BL. In these 129 ENL was seen in 11.6% at registration, 82.2% during treatment, and 6.2% after MDT completion. It is Mild in 17.8%, Moderate in 47.2% and severe in 34.8% of cases. The number of episodes of ENL seems to be more in cases with high positivity. Only 34% of the ENL cases are females. **Conclusions :** ENL is more commonly seen patients during treatment. Higher frequency of ENL is observed in high positivity cases. **Key words :** BI, ENL, RJ classification.

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Type 2 reaction in leprosy causes disability and suffering in at least 10% individuals with multibacillary leprosy. Prednisolone is effective and safe for controlling reaction in the majority of cases, but a minority need alternative or supplementary drugs. Leukotriene inhibitors have been used "off label" in a small series of cases with good effect. With patients' verbal informed consent, we gave zafirlukast or montelukast to selected patients suffering type 2 reaction who had contra-indications to prednisolone or adverse effects of steroid, when standard second line drugs were inappropriate or unavailable. Outcomes were recorded subjectively: patients self-reported well-being, dose of prednisolone needed to maintain control of reaction, and reduction in admissions. Amongst ten patients treated with Zafirlukast or montelukast at DBLM hospital over 2 years, eight experienced definite benefit without adverse effects and only one suffered mild adverse effects. A small scale formal trial comparing leukotriene inhibitors with standard steroid treatment for type 2 reaction is now underway. **Key words:** ENL, Type two reaction, steroid, second line drug, leukotriene inhibitors.

Need of New Immunosuppressive Agents for the Treatment of Leprosy Reactions

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Understanding the pathogenesis of reactions has helped in the selection of drugs for treatment, such as thalidomide, the primary treatment for erythema nodosum/multiform. However, due to its teratogenic effects thalidomide cannot be used in fertile women. In addition, leprosy reactions frequently recur or are resistant to treatment. In order to evaluate the effective use of thalidomide for treatment of leprosy reaction, the files of 145 patients exclusively treated with thalidomide at the Leprosy Outpatient Clinic, Oswaldo Cruz Institute since 1990 until 2006 were evaluated. Only 43 patients had standard thalidomide treatment for up to 3 months and 59% of the patients had more than one episode. Out of the total of 245 episodes evaluated, 70% required more than 3 months treatment. Mean duration was 7 months, but in some patients reaction lasted more than 30 months. Severe episodes were found to be a risk for having prolonged and/or recurrent reactions (RR=1.23; CI= 1.02-1.48). The long duration of treatment observed indicates the development of refractoriness to thalidomide in a large group of patients. Thus, there is need to explore new immunosuppressive agents for treatment of recurrent or resistant leprosy reactions.

Study of ENL Pattern in Leprosy

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Introduction : BOLEP is a LEPRA Society project started in 1991 for leprosy services and covers the entire Subarnapur district with a present population of 5,78,932. Till the integration in 2001, it has under taken regular activities like implementation of MDT and complication management in leprosy. All the cases were subjected for skin smear examination and the results were graded in the Ridley scale. **Methodology :** It is a record based study from the data of 1991 to 2001. During the period a total 22,075 leprosy cases were detected of which 6270 (28.4%) were MB type. Among these MB cases, 1990 (31.7%) were smear positive. Among these positives, 129 (6.4%) suffered from ENL. The data of these 129 cases was analysed. **Results :** Among the 129 ENL cases 98 (76%) are LL and 31 (24%) are BL. In these 129 ENL was seen in 11.6% at registration, 82.2% during treatment, and 6.2% after MDT completion. It is Mild in 17.8%, Moderate in 47.2% and severe in 34.8% of cases. The number of episodes of ENL seems to be more in cases with high positivity. Only 34% of the ENL cases are females. **Conclusions :** ENL is more commonly seen patients during treatment. Higher frequency of ENL is observed in high positivity cases. **Key words :** BI, ENL, RJ classification.

Type I Lepra Reaction Presenting as Immune Reconstitution Inflammatory Syndrome

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Immune reconstitution inflammatory syndrome (IRIS) is defined as occurrence or worsening of clinical and/or laboratory parameters despite a favorable outcome in human immunodeficiency virus (HIV) surrogate markers (CD4 counts) and plasma viral load. IRIS is an inflammatory reaction occurring due to strengthening of immune system in HIV-infected patients after initiation of antiretroviral therapy. Causes of IRIS can be infectious and non-infectious. In India where leprosy is prevalent, IRIS in HIV positive individuals can manifest in the form of lepra reactions. We report a case of HIV-infected male who presented with borderline tuberculoid leprosy in type 1 reaction after the initiation of highly active antiretroviral treatment (HAART). Patient presented with multiple, tender, edematous and erythematous plaques on the trunk and extremities after 3 months of antiretroviral therapy. Lesions showed hypoesthesia associated with painful enlargement of nerves. Patient was started on multidrug therapy (MDT) with continuation of antiretroviral treatment.

Evaluation of the Occurrence of Type I Reaction in Hanseniasis [Leprosy] Patients

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Introduction : Hanseniasis reactions can happen at any time of the disease's chronic course, except in its undetermined form. In the T and D forms, the most frequent reaction is cell-mediated and referred to as type 1 reaction. **Methods :** The assessment of 123 Hanseniasis patients of both genders (60 with T form and 63 with D form) included clinical diagnosis, biopsy, Mitsuda reaction and bacilloscopic index. **Results :** Of the 123 patients assessed, 59 (47,68%), of whom 35(59,32%) were females and 24(40,96%) males, showed reaction episodes, which happened before, during and after drug treatment. These reaction episodes occurred in 39(66,10%) of the patients exhibiting the D form and 20(33,89%) with the T form of the disease. **Conclusions :** Type I reaction happened in 47,96% of the patients. Incidence was higher among dimorphic cases with predominance of the female gender and negative Mitsuda reaction. **Key words:** hanseniasis – type I reaction.

The Frequency of ENL in Patients Received WHO MDT

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The aim : to estimate the frequency of ENL in leprosy patients received WHO MDT. **The methods :** clinical control. **Results :** ENL developed in 35 % of patients received WHO MDT and began in the period of 6 months 2 years after treatment beginning. One patient had some episodes of ENL in anamnesis before leprosy was diagnosed. In two patients it was necessary to stop the treatment for some time because of hard ENL. None patients with ENL showed the progression of damage of peripheral nerves. **Conclusion :** As ENL often takes the chronic character and lasts more than 2 years, the shortening of the therapy may increase the risk of disability development. Only specialists can diagnose ENL and minimize the risk of lowering the quality of patient's life. May be the high percent of ENL was connected with the age of patients under control (mostly older than 60 years). **Key words :** leprosy, WHO MDT, ENL.

Co-Existing : Type I and Type II Lepra Reaction in a Borderline Lepromatous Patient

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Although the aetiology of Type I and Type II lepra reactions is still not fully understood, they are both well described and encountered across the spectrum of Hansen's disease. Type I reactions are commonly seen in BLHD, while type 2 reactions are commonly seen in LLHD and infrequently in BLHD. To have both type I and type II reactions coexisting is very rare and only a few have been reported to date. We report a 33 years old man who had been diagnosed to have leprosy and treated with MDT. His skin smear was BI = 3.25 + with no MI. He presented with crops of painful nodules diagnosed to be ENL histologically. On examination, he also had large erythematous oedematous non-anesthetic plaques, which showed histological features of Type I reaction. The patient was treated with Clofazimine 100 mg. tid, Hydroxychloroquine and tapering doses of oral steroids, with which both reactions were controlled. This case is reported for its rarity.

Azathioprine in Type I Reaction in Leprosy

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Introduction : Treatment with prednisolone in Type I Reaction and neuritis in leprosy is the mainstay and its role is well known. But recurrence of reactions in leprosy is unavoidable in 15-20% of patients. There is a need for an optimum steroid regimen. Alternative drugs also need to be explored. Azathioprine (AZT) is an immunosuppressant and is useful in several immune related conditions and has been reported to be useful in leprosy. **Material and Methods :** Patients with repeated type I reactions visiting the Referral Centre of Bombay Leprosy Project were selected. Basic investigations like haemogram, liver function test, renal function test and urine routine along with clinical, bacteriological & nerve assessment was done and repeated fortnightly. Clinical photographs to assess the progress were taken. After informed consent, patients were included in Group A (Only AZT) or Group B (AZT + prednisolone). Patients were followed up for one year. **Results :** Fourteen patients have been included so far (Group A -7, Group B -7). Three patients improved in AZT, while six improved in AZT + prednisolone. Two are under treatment. In three patients, the clinical response was static. Three patients had abnormal liver function tests and leucopenia. **Conclusion :** Most of the patients tolerated the drug well. It is early to comment on the efficacy. Follow up of the patients is in progress and we intend to increase the number of patients in the study.

Chronic Myeloid Leukaemia in a Leprosy Case – A Sequential Observation of Haematological Parameters

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The association between malignancies and leprosy is uncommon. We report the sequential observation of haematological changes in a leprosy patient with Chronic Myeloid Leukaemia (CML). CASE REPORT A known case of leprosy patient got admitted on 10-2-2000 in our hospital for plantar ulcer care. Haematological tests were done as part of routine investigations, showed leukocyte count – 8,400/cumm, normal differential count and hemoglobin percentage. Subsequently he got admitted four times with a periodical interval ranging from 6-8 months for plantar ulcer treatment between 15-9-2000 and 5-8-2002. Total leukocyte counts during the four visits were observed to be 19200, 34600, 64000 and 2,20,000/cumm sequentially. Differential counts of leukocyte showed mild to marked shift to left. At later stage, 5-10% blasts were also observed in the last sample. Rise in platelet count, Basophilia and fall in hemoglobin was also documented. Bone marrow examination and Philadelphia chromosomal studies could not be carried out due to lack of facilities. Massive splenomegaly and hepatomegaly were noted clinically. All other vital signs were normal. Patient was advised to attend medical college Hospital, Chengalpattu for further management. Patient expired after 16 months, may be due to blast crisis. This is one among the rare reports on occurrence of CML in leprosy patient.

P-22**Histioid Leprosy - A Report of Six Cases**

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Histioid leprosy was believed to be a drug resistant type of leprosy. we report six male patients of histioid leprosy ranging from 38 to 45 in age. All patients had shown the characteristic histioid nodules. chest wall and abdomen were mostly affected. slit skin smears ranged from 4-5+ BI. histopathology was characteristic in all cases. the patients responded to treatment with standard WHO MDT-MB regimen. These cases were highlighted for their rarity.

P-23**A Case of Spontaneous Recovery from MB Relapse vs A Possible Case of Late Lepra Reaction Mimicking Relapse (?)**

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This case report aims to demonstrate the complexity of leprosy as an immunologic disease and the importance of the patient's immune response to *M.leprae* in determining the clinical course of the disease. A 29 year old male was clinically and histopathologically diagnosed of lepromatous leprosy. The initial average BI was 4.8+. A couple of years after treatment completion, all lesions had disappeared. Skin smears taken from standard sites also became negative. On the 5th year after treatment completion, numerous new skin lesions consistent with leprosy associated with neuritis were noted. Steroids relieved the neuritis but the lesions persisted. On the 7th year, the highest BI at one site was already 2+. Histopathology showed indeterminate leprosy. Despite these findings, no additional anti-leprosy treatment was taken. However, a year later, spontaneous and complete clinical, bacteriologic and histopathologic clearance of the disease was demonstrated.

P-24**Reactive Perforating Hanseniasis Pustular Erythema Nodosum Leprosum with Transepidermal Elimination of Acid Fast Bacilli - A Case Report**

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A 23-year-old Indian male presented with pustular erythema nodosum leprosum reaction (ENL), developing *de novo*. He had multiple pustular and crusted skin lesions on extremities and trunk, along with other features of ENL. Slit smear examination from the skin lesions was highly positive and histopathology confirmatory of ENL reaction. The dense upper dermal acute inflammatory infiltrate was seen perforating the epidermis along with multiple solid staining acid fast bacilli to collect under the stratum corneum. Transepidermal elimination of lepra bacilli has been reported rarely in reactional leprosy. However, this may an important mode of elimination of acid fast bacilli through the skin in reactional leprosy, specially from the pustular, vesiculo-bullous, eroded or crusted skin lesions. The author's earlier reports of inoculation leprosy after unhygienic tattooing and smallpox vaccination and the present case, strongly suggest the role of skin in leprosy transmission. This is the first report TEE in pustular erythema nodosum leprosum reaction in leprosy.

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Reporting a large swelling in the Right elbow region in a leprosy patient with no neurological deficit in the muscles or sensation in the area supplied by the Ulnar nerve, the swelling was noticed 5 years ago which slowly grew in size over the past 5 years. He was treated for leprosy based on skin patches and was given MBMDT for 1 year, RFT 1 year ago. Initial and RFT smear were negative for Lepra Bacilli. On examination the following Differential diagnosis were made 1. Large Lipoma 2. Ulnar Nerve Abscess 3. Tuberculosis of the Elbow Joint with a cold abscess On exploration a large abscess arising from the Ulnar Nerve is seen (pedunculated). This abscess was managed by total excision of the abscess and hemi circumferential neurolysis of the Ulnar nerve with no nerve function loss. **Key words** : ulnar nerve, nerve abscess.

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Introduction : The occurrence of edema in the course of leprosy is relatively frequent and classically he is described in the course of the reactional states. **Method** : Medical records were recovered' **Result** : Mrs. of 54 years, obese, diabetic type 2, hypertension, of the home, without antecedent for leprosy, edema vespertine, cramps and parestesias. Normoestésicas cutaneous injuries, edema, absence of neural thick. Normal sensitive and motor mapping. Negative bacilloscopy, serum hormones thyroid T3: 0,39 (VN: 45-137 ng/dl), T4: 0,40 (VN: 4,5-12,5µg/dl), TSH: 97,61 (VN: 0,5-4,7 µUI/ml), glycemia: 100 dl(VN: 70- 99 /dl). Electromyography: Syndrome of the tunnel carpo and the accented, bilateral tunnel tarso and of the canal of Guyon accented in the left hand. Diagnosis of which had serious neuropathy to the serious hypothyroidism. **Conclusion** : Edema e the neuropathies of leprosy can be confused with other illnesses or turns associates they, therefore it has necessity of if investigating the diverse etiologies.

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Introduction : Type I reaction poses as one of the most challenging clinical problems in leprosy management. Using steroids in standard schedule helps to control reactions, but 15 – 20% of patients develop recurrences. We present a case report of a young girl with recurrent Type I reaction in Leprosy. **Case report** : A young girl, RR/10 years was referred to the Referral Centre of Bombay Leprosy Project with multiple deeply erythematous raised skin lesions on face, upper limbs and lower limbs with duration of seven months. Diagnosis of Type I reaction without neuritis was made. Patient was abnormally obese (weight 50 kg) compared to her age. Mean B.I. was 1+. She was put on prednisolone 40 mg/day, tapered gradually over eighteen weeks. Standard MB-MDT started after giving steroids for two weeks. Patient responded well but when dose was tapered to 5mg / day, developed recurrence of lesions on face and extremities with intense erythema. No nerve function impairment observed. At the time of recurrence and on history it was found that the girl had severe upper respiratory tract infection a few weeks back. **Discussion** : Recurrence of type I reaction in leprosy particularly in the adolescent age group and its management may be challenging, as some cases are refractory to anti-inflammatory treatment. The interest in this case is whether the recurrence was due to any endocrinal/ hormonal involvement in adolescence or whether concurrent illness precipitated the reaction. The exact endocrinal mechanisms are not clear to help a rational approach to management.

P-28**Leprosy and Co-morbid Disease : A Profile from A Regional Hansen's Disease (Leprosy) Clinic in The USA**

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Patients with a range of chronic primary disorders such as diabetes, heart disease, COPD [chronic obstructive pulmonary disease], Parkinson's Disease, Huntington's Disease, and Rheumatoid arthritis, to name a few, often suffer from concurrent, co-morbid disorders. There is ample literature published which contends that patients with such multiple medical disorders do not fare as well in disease resolution and functional outcomes as those who have fewer co morbid disorders. Patients affected by leprosy unfortunately can also develop concomitant disorders which may hinder healthy clinical and functional outcomes. Primary care providers need to consider this in order to prepare a dynamic and holistic plan of care. There are currently several hundred patients affected by leprosy being served at the Regional Hansen's Disease Clinic in Los Angeles. This clinic is one of 11 regional clinics situated throughout the USA which are administered by the National Hansen's Disease Program based in Baton Rouge, Louisiana. The purpose of this poster presentation is threefold. 1. To highlight the varieties of complications sustained by many patients affected by leprosy with co morbid disease and the ramifications of such morbidities in the context of their activities of daily living (ADLs). 2. To elaborate on the strategies and interventions selected to help ameliorate the resultant complications, impairments or disabilities. 3. To educate the reader of the value of monitoring any complications, impairments, or disabilities that arise from such co-existing disorders in order to optimize overall clinical and functional outcomes.

P-29**Co-Infection of Mycobacterial Diseases**

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Introduction : Damien Foundation Bangladesh has been providing Leprosy and TB Control services since 1994 through combined TB & Leprosy clinics. This retrospective study was carried out to see the frequency of co-infection by Mycobacteria (*M. tuberculosis* & *M. leprae*). **Methodology :** A 10 years Cohort Study was conducted in 6 districts of northern part of Bangladesh covered by Damien Foundation. The cohort consisted in a total of 4788 leprosy cases registered during 1997 to 2006. This study was based on examination and analysis of treatment records of all cases. **Results :** There was a total of 25 (0.52%) cases who developed both diseases. The average period between the occurrence of leprosy and tuberculosis (or the reverse) was 2.5 months. Among the co-infected cases 64% were multi-bacillary (MB) leprosy & 44% of the MB cases were bacteriologically positive. 92% of the Co-infected cases were males. All cases were co-infected with smear positive pulmonary TB. The mean age of the patients was 50 years (range 28 to 80 years). All Patients successfully completed their treatment for both diseases. **Conclusions :** Co-infection with TB/Leprosy is not rare. Early diagnosis and simultaneous treatment can cure both diseases and can limit chronic suffering and disability. **Key Words :** Co-infection, TB, Leprosy.

P-30**Leprosy in AIDS' Immune Reconstitution Syndrome**

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Introduction : Leprosy and HIV infection are highly prevalent in Brazil, although few reports have examined the interactions between these two infections. The authors demonstrate that leprosy reverse reaction in AIDS' patients under anti-retroviral therapy may represent immune reconstitution syndrome. **Methodology :** Clinical and laboratorial data of seven AIDS out patients under HAART therapy who had leprosy reverse reaction during their immunological improvement. **Results :** The seven patients were classified either under tuberculoid borderline or borderline leprosy. Despite severe reversal reaction, all of them had favorable evolution, reassuring the assumption that AIDS does not interfere in the evolution of leprosy, although HAART may interfere in the presenting features of the diseases. **Conclusions :** Despite not having caused a specific impact in the trend of the disease in Brazil, it may change the form of presentation of the disease in the context of the immunological HAART-induced reconstitution syndrome. **Key Words :** AIDS, Leprosy, immune reconstitution syndrome.

Concurrent Leprosy and Tuberculosis : Report of Seven Cases

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Introduction : Leprosy and Tuberculosis are endemic in Brazil. Clinical, epidemiological, immunological and therapeutically aspects was studied in seven patients who presented concurrent leprosy and tuberculosis. **Methods :** Review of 07 files of Leprosy out-patients presenting concurrent tuberculosis, admitted to our University Hospital, from 1993 to 1996 to assess clinical, epidemiological, immunological and laboratorial data and therapeutics aspects. **Results :** Seven male patients, newly diagnosed, with the mean age 40 were treated with WHO/PQT MB (24 doses) and presented type 2 reaction and peripheral neuritis under thalidomide and steroids therapy except one who had episodes of reversal reaction also treated with steroids. The concurrent tuberculosis diagnosis was made during leprosy treatment. **Conclusion :** The concomitance of leprosy and tuberculosis are related to epidemiological and immunological aspects. We postulated that tuberculosis infection occurred after the leprosy infection because if it was previous, tuberculosis infection would be able to prevent multibacillary leprosy, as it occurs with BCG vaccination. **Key words :** Leprosy; Tuberculosis; Concurrent infections.

Notalgia Paresthetica : Differential Diagnosis of Leprosy

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Introduction : The Notalgia paresthetica (NP) is a rarely reported dermatologic condition characterized by hypoesthesia and, at times, pigmentation in a patch on the medial scapular border. Is sensory neuropathy of posterior rami of thoracic nerves T2 - T6. In addition to intense pruritis, a few patients have complaints of "tingling" and hyperalgesia with tenderness on the spinous processes. Sensation to light touch, temperature, and vibration may be normal or abnormal and hypoesthesia to pinprick may be noted. The cause of this disorder is not known. **Case Report :** Mrs. 32 years, has one year with stains brownish in the left, not pruritus dorsal region and with dormant. It denies contact with leprosy. Stains brownish area from T2 to T6 thoracic dermatomes, thermal, protective and tactile hypoesthetic. Initially with diagnosis clinical of leprosy. However it did not have clinical improvement, then, carried through the biopsy, with the suggestive finding of NP. **Conclusion :** NP is not rare, but underdiagnosed for the poor clinical relevance. It is important to leprologist familiarize the with this relatively common entity. **Keywords :** leprosy - notalgia paresthetica.

Ultrasonographic Evaluation of the Median nerve in Leprosy

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Introduction : Early diagnosis of neuritis in leprosy is essential to reduce disabilities. Only a few works exist on the evaluation of nerve thickening by ultrasound in leprosy. The specific objective was to compare the diameter of the median nerve, at a given location, in leprosy patients to that of normal persons, using ultrasound. **Methodology :** 20 adult patients with paucibacillary leprosy and 20 adult healthy individuals, with equal gender distribution, had their median nerves, at the anterior surface of the distal third of the forearm, examined by ultrasound. A 7.5 MHz ultrasound device was used to measure the largest and the smallest transverse diameters of the nerve. **Results :** Transverse ultrasound sections have not shown either thickening or asymmetry of the nerves. The largest transverse diameters in leprosy patients, as well as in control individuals, were significantly ($P < 0.01$) greater in males (mean 4.3 mm) than in females (mean 3.8 mm). **Conclusions :** In this work, no differences were found, between leprosy patients and normal individuals, in the diameter of the median nerve. The nerve, at this location, was found to be thicker in males than in females. **Keywords :** Median nerve. Neuritis. Ultrasonography. Leprosy.

Comparison of Skin Smear, Histopathology and Clinical Data in the Diagnosis and Classification of Leprosy

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Introduction : A number of assessments are made of patients in order to correctly classify the type of leprosy presenting according to the Ridley- Jopling (RJ) spectrum of the disease. These include the clinical signs and symptoms observed by the clinicians, skin slit smear, and histopathological examination of the skin. **Methods :** We undertook a retrospective chart review of all patients for whom histopathological reports were obtained during the period 2000- 2006. This included a total of over 700 patients. Correlation between the clinical and histopathological data recorded was analysed, and the relative utility of clinical tools in classifying the disease was evaluated. **Key words :** skin smear , histopathology and clinical correlation

Axonal Motor and Sensory Polineuropathy Complicated with Leprosy and Pellagra

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Introduction : This is a case report to highlight the high prevalence of leprosy in Brazil and the concomitant occurrence of leprosy with other dermatologic diseases and neuropathies of distinct etiologies. **Methods :** Patient's clinical record review. **Case Report :** This is a 54 black male patient, living in São Paulo, Brazil. He was diagnosed with congenital strabismus, hypertensive disease, chronic use of alcohol and smoking. Between 2006 and 2007 he was diagnosed and treated with polichemotherapy for borderline leprosy, level 2 handicap and vitamin B deficiency (pellagra). Besides the characteristic leprosy neuropathy he presented other clinical signs as follows: winging scapula, deltoid and biceps muscle hypotrophy, and temporal muscle atrophy. Tendon reflexes were absent in the four limbs. Eletroneuromiography showed leprosy sensory polineuropathy, associated to chronic motor sensory neuropathy secondary to brachial and distal wallerian degeneration. The most probable diagnosis is of Hereditary Motor and Sensory Neuropathy, or Charcot Marie Tooth type II. Genetic investigation is ongoing. **Keywords :** leprosy, CMT, pellagra

A Retrospective Study of Neuritis Cases From 2000 to 2006

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Introduction : Peripheral nerve damage is a major challenge in leprosy. Neuritis may occur with or without Type I & II reaction. A retrospective study was undertaken to gain insight into factors contributing towards neuritis. **Methodology :** When 660 cases registered from 2000 – 2006 were analyzed retrospectively, 127 had neuritis. Complete clinical details were documented for 52 cases. **Results :** 73% of neuritis cases fall in 15-20 year age group. 26% of cases were females. 65% of neuritis cases had anesthesia, 27% were associated with Type I and/or Type II reactions. A correlation of clinical with histological classification was observed in 9.5% of skin and 66% of nerve biopsies. 11.5% cases had neuritis even after RFT. Majority of cases had steroid treatment for a period of 6-12 months. Contribution of BL and LL cases towards neuritis was more compared to BT cases. **Conclusion :** Gender, age, number of lesions and truncal nerves involvement were associated with neuritis. Improvement in motor function was more than sensory function. **Key Words :** Leprosy, neuritis, Peripheral Nerve damage, steroid.

Lower Touch Sensibility in the Extremities of 568 Healthy Indian Subjects : Further Deterioration with Age

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Background : Touch sensibility testing with Semmes-Weinstein monofilaments (SWM) is a cost effective, objective measure of peripheral nerve impairment. **Methods :** Since detection of early nerve deficit would be important for prevention of deformities, 568 healthy Indian volunteers without any clinical evidence of disease were evaluated for touch sensibility in the palms, feet and heels, using SWM, with target forces ranging from 0.008 to 300 gm. **Results :** The lowest and the highest target force detected in the palm was 0.4 gm and 2 gm whereas, 1.4 gm and 15 gm respectively were observed in the foot. These values are higher than reported for other populations. The palms were more sensitive than the feet or heels ($p < 0.0001$). With increase in age there was reduction in sensory perception in both extremities ($p < 0.0001$). Women as compared to men had higher sensibility in the palms. **Conclusions :** These findings have clinical implications for the diagnosis of early nerve impairment in leprosy patients especially in the elderly age group and draw attention to geographic variations in touch sensation. **Key words :** Sensibility, sensory testing, screening for neuropathy, SWM filaments, India.

Scrotal Skin Involvement in Lepromatous Leprosy

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Introduction : Scrotal skin is considered to be immune to the occurrence of leprosy lesions despite the lower temperature of scrotum and testicles which favours the growth of *M. leprae*. We hereby report a rare case of involvement of scrotal skin in lepromatous leprosy. **Case report :** A 60 years old male patient presented with progressive, hypopigmented, shiny plaque measuring 3x2 cms in size over the anterior surface of scrotum of 6 months duration. The plaque was infiltrated with intact sensation. On further examination similar lesions were found on the medial aspect of both the thighs. Bilateral ulnar and common peroneal nerves were thickened and non-tender. Routine examination of blood and urine were normal. Slit skin smear for acid fast bacilli showed 4+. Biopsy confirmed the clinical diagnosis of lepromatous leprosy. **Discussion :** Though scrotal skin is considered to be immune to the occurrence of the leprosy lesions, clinical involvement of the scrotal skin in all types of the disease spectrum has been reported by several workers. In continuation to the above presentations we hereby report a case with involvement of scrotal skin in lepromatous leprosy.

Clinical Pathological Correlation in 952 Cases of Leprosy

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Leprosy is diagnosed by its classical features. at times the diagnosis becomes difficult and we have to resort to simple investigative procedures like skin biopsy. Aim: To correlate the clinical and histological features in leprosy. **Materials and Methods :** 952 cases were taken for the retrospective and prospective study. 110 nerve biopsies were done. Slit smears were done in all cases. the results were analyzed using paired T tests. **Results :** Correlation was higher in TT leprosy (74%) and in LL leprosy (82%). borderline and indeterminate cases showed much variations. Patients who attended within six months on onset of the symptoms showed higher degree of correlation. Nerve biopsy was found useful in diagnosis in patients with shorter duration of symptoms and in difficult cases. **Conclusion :** histopathology of skin and nerve biopsies were useful in 70% of cases.

A Case of Florid Lepromatous Leprosy with Palatal, Oral and Nasal Involvement with Septal Perforation, Identified in the Post Elimination ERA

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A patient is reported who presented with multiple nodules all over the body. He was diagnosed to have LL HD with palatal, oral mucosal and nasal involvement with a septal perforation. Contact examination revealed that his wife had Borderline Tuberculoid leprosy. We wish to emphasize the fact that in the post-elimination era, after the leprosy programme has been integrated, diagnosis may be delayed. This would result in existence of pockets where highly bacilliferous cases may continue to be present in the general population and thus be sources of infection within the community. This may also be responsible for the continued transmission of the disease, and non-decline of the incidence rates in spite of adequate leprosy control activities. We cannot over-emphasize that in addition to early diagnosis and commencement of treatment, contact examination is of paramount importance.

Neural Pain in Leprosy Patients

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Neural pain is one of the most distinctive and important symptoms in leprosy. In order to prescribe the adequate treatment it is essential to differentiate neurogenic from neuropathic pain in these patients. A retrospective analysis of 697 files of the FIOCRUZ Leprosy Clinic showed that 124 patients referred neural pain during follow-up. Neuropathic pain was observed in 55 patients, neurogenic pain in 50 and both in 19. Sixty percent of the patients (71/119) had altered ENMG all with mononeuritis multiplex. Among the 69 patients with neurogenic pain, the most frequent pattern of neurophysiological lesion was demyelination. Although most of the lesion had no definitive pattern (non-classified=23%) among patients with neuropathic pain, axonal was 13%. The patients demonstrating neuropathic pain had more severe neurological dysfunctions and conversely, patients with neurogenic pain had a tendency to develop a reversible nerve dysfunction. **Keywords :** Neuropathic pain, neurogenic pain, ENMG, demyelination.

The Uncomplicated Neuropathic Foot in Leprosy Patients : A Clinical and Radiological Follow-up Study

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An MRI study in 2000 on 10 leprosy patients with neuropathic feet, but without clinical complications such as ulcerations, osteomyelitis or Charcot deformities (so-called uncomplicated neuropathic foot), revealed abnormalities in 9 patients, with degradation, interruption of subcutaneous fat and effusion/synovitis, all located in the first metatarsophalangeal (MTP) region. Since these MRI abnormalities may precede clinical complications of the foot, a follow-up study was performed. **Methodology:** New evaluation was based on a clinical examination and an MRI **Results :** Four patients were lost to follow-up. Average follow-up period was 4.6 years. MRI findings in the MTP 1 region at the start of the study disappeared in 3 patients, but were still present in 2 patients. In 6 patients new MRI findings were found, without clinical signs of ulcerations, osteomyelitis or Charcot deformity. No relationship could be found between MRI findings in the MTP 1 region at the start of the study and the development of foot ulcers, callus or skin fissures in the MTP 1 region during follow-up. **Conclusion :** MRI findings of interruption and infiltration of the subcutaneous fat of uncomplicated neuropathic feet in leprosy patients do not necessarily have any clinical implication for the development of future foot problems. **Key words :** leprosy, osteomyelitis, neuropathy, imaging.

Histoid Leprosy in an Eight Year-Old Child

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Introduction : The histoid type of leprosy has been described as occurring in lepromatous leprosy patients who relapse after many years of apparently successful dapsone monotherapy. The authors demonstrate a case of histoid type of leprosy in a eight years old child who had never received anti-leprosy treatment. **Methodology:** clinical and laboratorial data of a child with histoid leprosy. **Results :** The child presented with a number of erythematous to brownish gray, firm but elastic nodules involving mainly the extremities. The skin biopsy showed histologic pattern of histoid variety of lepromatous leprosy and the skin smear showed a high bacteriological index. He had never received anti-leprosy treatment and neither his parents and others relatives. **Conclusions :** After India, Brazil is the second country with the greatest number of cases in the world. Histoid leprosy may occur as a relapse, in the setting of sulfone resistance, or may present de novo. This is a great public health problem and early detection and management of this entity among children is very important. **Key words :** histoid, leprosy, child.

Leprosy Patient`s Perception and Reality About Oral Health

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Introduction : The objective is to know the oral condition of leprosy patients, the perceptions about their oral health and the way with they deal with their problem. **Methodology :** 63 leprosy patients answered a questionnaire, and were undergone the oral examination in Serra, Brazil. **Results :** Age ranged from 9 to 70 years; 46% were female and 54% were male; 65% had less than 8 years of study; 65% classified themselves oral health varying regular to excellent. 71,4% patients had lost at least a tooth; 30% used some type of prosthesis and the necessity of prosthesis was of 54%; and 36% had more than 3 years from the last dentist evaluation; and 43% were assisted at the private service. The pain (36%) was the most frequent complaint that it was treated in the majority of the cases with dental extraction (30%). The periodontal disease was shown in 32% among patients up to 30 years of age. **Conclusions :** The toothache was the most frequent dentistry complain, the earlier dental extraction was a serious problem. Difficulties at accessing the public oral services even though they are provided. Patients did not realize their own oral condition, and caused a contradiction between their perception and dental findings. **Key Words :** bucal, periodontal disease, tooth. **Financial Support :** FAPES/ES/Brazil

Pathogenetic Factors of Liver Damage and Their Correction in Treated Leprosy Patients

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The aim of investigation is to improve the diagnostics and treatment of hepatitis in leprosy patients during chemotherapy. Methods are biochemical, immunologic, cytochemical. There were observed 60 treated lepromatous leprosy patients. It was stated that 20% cases had the features of liver damage characteristic of chronic persisting hepatitis. It was shown that such patients had some signs of oxidative stress in type of increased secondary lipid peroxidation products concentration determined by ultraviolet spectroscopy method and increased level of stable to oxidation lipids in blood. These changes were combined with increased spontaneous chemiluminescence of circulating leucocytes «in vitro». Besides it, the patients with hepatitis had increased level of C-reactive protein and tumor necrosis factor alfa. During hepatoprotective therapy the patients had ademetonine (heptal). After the course of therapy there were observed the positive clinical and laboratory dynamics. Pathogenesis of leprosy hepatitis is connected with combination of metabolic and immunologic mechanisms, effective correction of which is possible by heptal usage. **Key words :** leprosy, lipid peroxidation, heptal.

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The aim : to perfect the methods of physical rehabilitation of leprosy patients. The method of treatment and prophylaxis of specific neuritis and neurotrophic ulcers of feet in 60 leprosy patients at the age of 31 to 75 was used in combination with apparatus phototherapy, neuroadaptive electrostimulator "scenar" there was made the electropunctual processing of skin zone in damaged nerves. In case of surface neurotrophic ulcers of feet the phototherapy by apparatus "Ivolga" was used. In complex cases laser therapy with the help of apparatus "Mustang - Bio" was used. Combined indication with complex chemotherapy decreases the risk of leprosy complications and improve patients' life. The pain syndrome disappears, the dates of recovery decrease, the number of ulcers becomes less. The results were proved clinically and by laboratory data. The number of serum neuropeptides increases, positive dynamics of electropunctual meridians Riodorakus, biologically active points of skin, improvement of microcirculatory processes in tissues. The usage of this method increases effectiveness of rehabilitation and may be recommended to practical work. **Key words :** physical rehabilitation.

Pseudo- Isomorphic Phenomenon of Koebner in Histoid Leprosy - Yet Another Evidence of Role of Skin in Leprosy Transmission

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A 30-year-old Indian male with histoid leprosy developing *de novo*, had pseudo- isomorphic phenomenon of koebner on the left buttock, suggested by the linear distribution of skin lesions. He also had several umbilicated (molluscoid), crusted / eroded histoid lesions on the limbs and the trunk. Slit smear examination was highly positive and histopathology confirmatory of histoid leprosy, sections showing acid fast bacilli at umbilicated, eroded sites also. This phenomenon occurs in certain infectious skin diseases like warts and molluscum contagiosum due to auto-inoculation of the infectious organism at traumatic sites. Similarly, it is possible that the bacilli excreted from the dense, rapidly growing granulomas in the present case, might have been subsequently inoculated through the traumatized skin. The author's earlier reports of inoculation leprosy after tattooing and smallpox vaccination as well as the present case, strongly suggest the role of skin in the transmission of leprosy. This is the first report of pseudo-isomorphic phenomenon of Koebner in leprosy.

Classification of Leprosy Patients : Comparing Three Methods to Differentiate Between PB and MB Leprosy

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Introduction : Due to the wide range of presenting signs, correct classification of leprosy patients remains a clinical challenge. A number of classification methods have been utilised: the current WHO classification guidelines are based on counting only the number of skin patches and affected nerves. Utilization of skin smears in diagnosis and classification is not encouraged. Previously in Nepal a third method of classification was used, based on the number of body areas affected. **Methods :** In our clinics, patients have routine skin smears, and all smear positive patients receive MB MDT, irrespective of the number of patches or affected nerves. We have undertaken a retrospective chart review of all smear positive patients diagnosed in Anandaban during the period 2000- 2005, in order to compare the three classification systems. **Results :** Good agreement was found between all three classification systems, although both the WHO and "Nepal" classification systems under diagnosed MB leprosy, 23 (8.0%) and 25 (8.6%) of 288 smear positive patients being wrongly classified as PB using the WHO and "Nepal" clinical guidelines, respectively. **Key words :** classification in leprosy, correlation.

Leprosy Among Tribal Population In Chhattisgarh State, India

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Very little information is available on changing profile of leprosy among scheduled tribe population in several states in north India. Chattisgarh state is carved out of earlier Madhya Pradesh state and is situated near Orissa and Jharkand (formerly Bihar). Several districts in this state have a large component of tribal population, some of them in relatively inaccessible geographic areas. New leprosy patients seen at TLM hospital in Champa during the period 2003-2006 are described in relation to tribal and non tribal groups in terms of age, sex, type and severity of leprosy and deformity. Of 735 new patients registered, there were 57 tribals (32 males and 25 females), 196 scheduled castes and 482 belonging to other communities. Ten percent of tribal patients were children as compared to 15% among scheduled castes and 9% among others. Among tribals, MB patients constitute 72%, and 16% had grade 2 disability. 10% defaulted from MDT. Tribal patients compare well with others and have taken advantage of the leprosy services available, although there is still a delay in reporting. **Key words** : leprosy, tribal populations.

Clinical and Bacteriological Correlation : A Retrospective Study Among 1000 New Patients Registered for Treatment at Outpatient Facility in Uttar Pradesh

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Introduction : A popular outpatient facility attracts a large no. of patients from far and wide. In the elimination era also highly BI positive cases are also seen. **Methods** : Carefully kept clinical records gleaned for clinical and bacteriological data, collected, composed and compared for any correlation. **Results** : Over 600 new self-reporting cases get diagnosed with leprosy registered for treatment each year at this outpatient facility. Clinical and bacteriological records are kept and maintained according standard protocol. Data was collected for number of skin lesions, affected nerve trunks, with or without reaction episodes and bacteriological index on Ridley Jopling scale. These data pooled and analyzed for any correlation and the results reported for a 1000 patients. **Key words** : clinico-bacteriological correlation, leprosy.

Interference of Multibacillary form and of G6PD Activity in Anemization During Sulfone Treatment in Leprosy

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Introduction: Brazil is the country with the greatest number of leprosy. Anemia in leprosy can be caused by hemolysis due to sulfone (G6PD), through proper action of the drug, chronic inflammatory disease and by iron deficiency. This study verifies the frequency of anemia in relation to sex, age, form of the disease and dose of G6PD. **Methodology** : Review of charts in a retrospective study of ambulatory leprosy patients. They were classified with regard to age, sex, race, leprosy pole, G6PD enzyme activity levels, hematocrit, hemoglobin (Hb), reticulocytes, bilirubins, haptoglobin and DHL. **Results** : The total of 40 patients included 22 men and 18 women. 50% anemized in the two groups, all carriers of the multibacillary form. There was no correlation between age and anemization ($p=1,23$ for women and $0,49$ for men). There was no correlation between G6PD levels and anemização ($p=0,78$ for women and $1,34$ for men). **Conclusion** : The most important factor in anemization is the form of multibacillary presentation in the disease. There is no influence of gender, iron deficiency or G6PD activity in the genesis of anemia. **Key Words** : Leprosy, G6PD, hemolysis.

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Objective : To analyze the potential mistakes in the number of cases with relapse of leprosy in Brazil during 2000 to 2006. **Method:** Epidemiological descriptive study of the analysis of the proportion of relapse of leprosy in Brazil, during 2000 to 2006. All cases of relapse were included in the study by municipality that recorded the case for treatment. The proportion of relapse was calculated for every municipality of the Brazil and it was compared to the proportion of relapse in smaller and equal or bigger municipalities of 40 thousand inhabitants. **Results :** Out of 10,208 cases recorded by relapse of leprosy in Brazil, 6,793 cases occurred in municipalities considered medium-size or big-size (66.6%) and 3,415 (33.4%) cases were recorded in municipalities of small-size. These last one maintained bigger proportion of relapse than on average of the Brazil. The South Region presented the biggest proportion of relapse, corresponding of 8.1%. The South regions and Center-West showed been more influenced by the diagnoses of relapse of the municipalities of small-size. **Conclusion :** The increase in the number of relapse has been influenced by the diagnoses made at the municipalities of small-size. It implies in the need of the program of leprosy and epidemiological surveillance to follow the patients after cures or cases suspect of relapse. **Keywords :** Recurrence, leprosy, epidemiological surveillance.

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Elbow is rare site for squamous cell carcinoma, usually associated with post burn scar or DLE scars. Reporting a case of squamous cell carcinoma in a cured patient of lepromatous leprosy with glove and stocking anesthesia. The probable cause of squamous cell carcinoma is repeated trauma to the elbow. This case was managed with wide excision and radial forearm flap coverage. Post operatively there was complete functional recovery. **Key words :** squamous cell carcinoma elbow.

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After the integration of Leprosy with the general medical services, it is imperative that no leprosy cases be missed out more so when it presents atypically. Here were present three unusual cases of leprosy. A 38 year old male presented at the hospital with complaints of dryness and itching all and was treated with antihistamines for 3 months. The patient had infiltrative lesions all over his body, multiple nerves were enlarged and his BI was 6+. A 7 year old female child presented to the hospital with dry parchment like scaly lesions all over the body of 1 year duration. She was diagnosed by a dermatologist as Morphoea and was treated for about a year. A diagnosis of indeterminate leprosy was made and she was put on MDT and her lesions are slowly improving. A 60 years old male with BT and anesthetic hands and feet, was admitted for severe septic shock. He gave a history of rat bite 3 days back. He was diagnosed as Gas Gangrene clinically and treated vigorously and started recovering only after three weeks of intensive treatment.

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Objective : To find out the Self-reporting patient in leprosy statues and the duration taken for the presentation to the hospital.

Methodology : The patients registered during the period of 2005- 07 August were taken for the study. All the details of files were taken for analysis. **Results :** 119 newly registered case files of both paucibacillary and multi bacillary leprosy patients were analysed. The findings show that there were 82 males and 36 females. Among them there were 101 self-reporting cases were found. The duration of first presentation to the hospital varies between the periods of 0-3months., 3-6 months, 1- 2 years commonly and a number of 15, 24, and 28 are respectively found in this time bound. This means still early presentation is still lagging in the presentation some of 10 patients reported after a period of 10- 20 years and 13 cases were reported between the periods of 2 years – 3 years. Around a 66 cases were reported with the nerve involvement this means a 50 % of Patients find tough for early presentation or lack in knowledge for early signs and symptoms. The paper also presents other causes for

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Hypothesis : This study was carried out to see effects of the MDT in pregnancy. **Design :** Prospective Study. **Setting :** The study was undertaken in the TLM Chandkhuri Leprosy Hospital Dist Bilaspur. **Patients :** Total no was 20 whose who pregnant during the treatment. **Intervention :** MDT was started before/during pregnancy and patient was monitor for the outcome. **Result:** in 20 cases, 01 still born 1 IUD 4 ongoing but till date well, rest delivered healthy baby. **Conclusion :** It can be concluded that MDT is safe in pregnancy, can be used safely with close monitoring.

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Dapsone Hypersensitivity Syndrome occurs in 2% of leprosy patients in Nepal. DHS and other allergic effects due to dapsone lead to withdrawal of the drug. We reviewed the notes of patients who had dapsone withdrawn from their MDT following an adverse reaction to the drug. **Methods :** The database of leprosy patients treated at our centre between December 1981 and June 2007 was reviewed and the charts of those diagnosed with dapsone allergy retrieved. The charts were reviewed by an experienced physician and data entered into an Excel spreadsheet. Patients in whom there was confirmation of completion of a modified course of MDT were included for further analysis. Individuals were excluded if there was no record of completion of modified MDT (including those who died) or if the diagnosis of dapsone allergy was incorrect. **Results :** 105 patients were identified from the 8417 in the database. 101 charts were available for review. 67 individuals had confirmed completion of MDT. The distribution of Ridley-Jopling classification was TT = 6, BT = 21, BB = 2, BL = 18, LL = 12, I = 1, PN = 1 and was not available for 6. 36 had positive slit skin smears. 52 were treated with MB MDT and 15 PB. Following the withdrawal of dapsone 60 patients received rifampicin and clofazimine. The other 7 received various drug combinations. Serial BIs were performed and no cases of relapse occurred in this group. **Discussion :** Our findings suggest that treating patients unable to take dapsone with rifampicin and clofazimine is not associated with relapse. **Keywords :** dapsone, allergy, relapse.

Skin Lesions in Proximity to Nerves at Risk in Leprosy : A Reason to Start Immunosuppressive Treatment and an Indicator to the Transmission of Leprosy ?

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Introduction : This study reports on the relationship between a single skin lesion and the function of the nerve that is located in proximity to that skin lesion. **Method:** Charts were reviewed of patients with (T)-BT leprosy. The first cohort comprises 301 patients who attended a neuritis clinic. The relationship between skin lesion and Nerve Function Impairment (NFI) was also reviewed in a second cohort of newly diagnosed patients receiving MDT only. **Results:** In the first cohort, 31 patients (10.2%) were identified. Most patients with a single facial lesion (9/10) had normal function of the facial nerve. However, 16 patients were seen with a skin-nerve relationship of the ulnar and/or ulnar and median nerve(s), all of whom presented with NFI. In the second cohort of all newly diagnosed patients (n=327), 82 (25.2%) were classified as PB-BT leprosy. Ten were part of the first cohort. Of the remaining 72 patients, most patients (85.7%) with a lesion on the forearm or lower extremity had enlargement of the underlying nerve or the nerve proximal to the skin lesion. None of these patients had significant NFI. **Discussion:** In both cohorts nerve enlargement was not recorded in extremities in which there was no skin lesion. **Keywords :** ENL, thalidomide, prednisolone.

Occurrence and Management of 452 Patients with Leprosy Reaction in China

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Objectives : To understand the current situation of occurrence and management of leprosy reaction in the field from a point of health services. **Methods :** A retrospective survey using the questionnaire was carried out in the all provinces of China at the beginning of 2006. The studied patients were those underwent leprosy reaction from 1 January to 31 December 2005. All data were inputted the computer and analyzed using Statistical Program for Social Sciences software, version 10.0. **Results :** About 452 questionnaires collected from 25 provinces were qualified for analysis. Among them, 313 were male and 139 were female patients with a sex ratio of 2.25. Referring to the type of reaction, 159 were type I reaction, 273 were type II reaction and 20 were type I and II mixed reaction. About 72.4% of reactions occurred in the first year of MDT and 27.6% of patients developed leprosy reaction during the second year of MDT. The highest occurrence of reaction was during 1-6 month starting MDT. About 44.2% of patients were followed up once a month or more and 57.3% of patients developed new nerve damage/disability during and after MDT. **Conclusions :** New nerve function impairment and disability still occurred among patients during and after MDT. The early detection of leprosy reaction and nerve function impairment should be strengthened. **Key words :** Leprosy reaction.

The Possibility and Strategy for Misdiagnosis, Missed Diagnosis and Exceed Diagnosis of Leprosy

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1. The possible reasons of misdiagnosis and missed diagnosis. The possible reasons of misdiagnosis and missed diagnosis included lack of vigilance of leprosy, lack of the knowledge of leprosy, not completely and serious examination, lack of good skill of examination, lack of the complex analysis based on a lot of clinical and laboratory data, leprosy figures were covered by the other disease, the variation of clinical features, some patients hiding the truth of leprosy features, and so on. 2. The possible reasons of exceed diagnosis. Some reasons involved in exceed diagnosis of leprosy. They included exceed political promise, the positive to eliminate leprosy, target and reward encouragement, lack of knowledge in dermatology and neurology, leprosy paranoia missed diagnosed as leprosy, amplified the patients of "single lesion leprosy" and "diagnostic treatment of leprosy". 3. Strategy Firstly, we should keep "leprosy still existence" in the mind. Secondly, don't look down on the patients and pay more attention to them. Understand and confidence between patients and doctor were important. Thirdly, strictly follow the diagnosis and examination standard. Completely check up and consult the history of the disease. Fourthly, education of knowledge was more useful and important, such as dermatology and neurology for specialist of leprosy, and vice versa. Fifthly, careful long-term follow up of the patients and their closely relatives should be mandatory.

Clinical Study of the Damage of Ulnar Nerve and its Functional Branches in Leprosy Patients

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Objective : To Study the damage of ulnar nerve and its functional branches in leprosy patients. **Methods:** 84 lepers founded in Yancheng, Jiangse during recent 15 years were investigated by leprosy staffs and the ulnar nerve damage was judged by the regulated sense are and the dominated muscles of every branch of ulnar nerves. **Results :** 35 cases have ulnar nerve damages among 84 lepers, accounted for 41.67%, with an average of 3.74 branch involved. The deep division of the ulnar nerve (23.21%) and the finger cutaneous branches of the forth interspace (19.64%) were the mostly commonly invaded branches among 5 kinds of branches of ulnar nerves. The little finger ulnar cutaneous branches (16.67%) were also often involved. The dorsal cutaneous nerves of the hand (14.29%) were relatively less involved and the muscle branches of forearm of ulnar nerve (4.17%) were seldom invaded. The clinical features were dominated with the concurrent impairment of sense and motor, with a rete of 71.43% (25/35).

Conclusion : (1) The damage of ulnar nerve and its branches was commonly seen in leprosy patients. It is very significant in early detection of new leprosy case; (2) The damage of ulnar nerves was mainly presented with the type of branch damage. The branches located in the distal part of limbs were easily invaded by *Mycobacterium leprae*; (3) Early detection of leprosy case must be improved from the fact that the patients have high ulnar nerve damage rate and the damage are characterised with cutaneous sense and motor branches invaded. We suggested that carefully examination of the sence test including the dorsal cutaneous nerves sense test, be carried out to find the early nerve involvement. **Key Words :** Leprosy; Ulnar nerve; Functional branches; Damage.

MB—MDT Treated Leprosy to Recur 3 Examples

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Total of 287 leprosy cases (MB:235, PB:52) were treated with MDT regimen (WHO) from June, 1986 in Mianning county. 272 patients (MB2210PB51) among of those cases had finished the therapies and 266 (MB2150PB51) were cured. The cure rate increased obviously and those who cured would not suffered from the medication any more. We reported 3 relapsed patients who were treated in 2 years MB MDT regimens and followed up for 5 years and then were assessed to be cured. All of them were diagnosed from 1981 to 1982 and then were treated with only DDS or DDS combined RFP before MDT. We did not detected the drug-resistances of DDS and RFP on two patients who relapsed in 2005. All of 3 patients have not had disabilities and one of them had two episodes of relapse. MB-MDT re-treatment in each relapsed patient was still effective.

Therapeutic Effect Observation of Erythema Nodosum Leprosum (ENL) Reaction Treated with Combination of Traditional Chinese and Western Medicine

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Objective : Based on the Erythema Nodosum Leprosum (ENL) Reaction, the clinical effect of the peeled dry root of *Tripterygium wilfordii* combining with traditional Chinese dialectic treatment was studied. **Methods :** Based on traditional Chinese dialectic treatment, the treating group divides the reaction of leprosy ENL as (1) blood stasis type, (2) damp-heat type and (3) cold-dampness type. Use 15g peeled dry root of *Tripterygium wilfordii* as the basis, add with Taohong Siwu Soup plus Shixiao Powder, Si Miao Yong'an Soup, adjusted with Yang He Soup, decoct for two hours and take at two intervals, one potion per day, and 7 days as a course of treatment. If not healed, take another course of treatment and treated with western medicine according to the actual conditions of the disease. The control group was treated with Prednisone, Thalidomide, Potassium antimonyl tartrate (before 1985), B₆₆₆ (after 1985) and western medicine. **Results :** In the treatment group of 73 cases, 51 cases showed regression, 18 cases improved significantly, and the total efficiency rate is 94.5%. In the control groups of 52 cases, 34 cases showed regression, 14 cases improved significantly, and the total efficiency rate is 92.3%, $P > 0.05$, and the difference had no significance. In the comparison of regression time between the treatment group and control group, $P < 0.05$, the difference was significant. While the two groups in comparison of recurrence time after discontinued with treatment, $P < 0.05$, the difference was significant. **Conclusions :** The method of peeled dry root of *Tripterygium wilfordii* combining with traditional Chinese dialectic treatment has the ability to adjust the overall function of patient, and improves the organism immune function, with many advantages such as rapid effect, less side effect and longer recurrence time after being discontinued with treatment. **Key words :** Combination of Traditional Chinese and Western Medicine, Erythema Nodosum Leprosum (ENL) Reaction, Therapeutic Effect Observation.

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Objective : To study the influence of Leprosy reaction to clinic, bacterial and pathology. **Methods :** To observe the two groups, one is leprosy reaction and the other is non- leprosy reaction for new patients during the period of MDT. **Result :** BI decreases as the period of treatment increasing, and has significance difference comparing the tow groups at the 24months of treatment, has non-significance difference at the other periods of treatment. GF has non-significance difference at the period of treatment. BIG, LHI decrease obviously during the period of MDT, and has significant difference comparing the tow groups, the difference is more significant as the period of treatment increasing. **Conclusion :** Leprosy reaction has non-significant influence to BI and GF, and has significant influence to BIG and LHI. Prompting leprosy reaction influence leprosy bacterial apoptosis and degradation rate, increases the danger of disability and treating difficulty, also influence clinical cure.

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Objective : To investigative incident rate of silent neuritis in leprosy under MDT and supervisors and released control stage. **Methods :** To examine sensory and motor function of peripheral nerves at regular intervals so that early silent neuritis were discovered. **Results :** 456 cases of leprosy under MDT and supervisors and released control stage were observed. Among them 48 cases with silent neuritis were detected with 10.53% of rate. The incident rate of cases under MDT were significantly higher than in supervisors and released control stage ($P<0.01$). The rate in ulnar and tibial nerves was higher than in other nerves ($P<0.01$). The rate in ulnar and tibial nerves were higher than in other nerves ($P<0.01$). **Conclusion :** It is important for early detection of silent neuritis to examine function of peripheral nerve at regular intervals. **Key words :** leprosy; neuritis; Diagnosis.

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Introduction : The purpose of the study is study locognosia as a sensory testing tool in ulnar median nerve paralysis in leprosy and compare it with Semmes Weinstein monofilament testing **Methodology :** All patients who were assigned to have a sensory testing of the hand of hands were included in the study. Locognosia is the ability to localize touch/pressure to an exact point. The pulp on the volar aspect of the terminal segment is divided into four quadrants and each quadrant is tested for locognosia. The method of testing locognosia was explained to the patient and the test was carried out. Semmes Weinstein monofilament test was also done on the same hands. A group of controls also underwent both the tests. Thirty eight patients (73 hands) and 17 controls (33 hands) were tested. **Results and Conclusions :** Statistically significant difference between locognosia of leprosy patient group and the control group was observed. This difference was much more than that between SW testing between leprosy patients and the control group. There was also significant difference between locognosia and SW testing in picking out abnormal sensory function. Can locognosia be used to detect early nerve function impairment in leprosy? **Key words :** Locognosia, Semmes Weinstein testing, leprosy.

Poster Presentations

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Evolutionary Analysis of *Mycobacterium leprae* Strains by Using Two Variable-Number Tandem Repeats from Uttar Pradesh, India

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Introduction : Leprosy is a chronic disease caused by infection with *Mycobacterium leprae*. One difficulty in studying the mode of transmission of leprosy is the small amount of variation initially reported in bacterial genomic DNA. PCR-based amplification methods have been developed to overcome the problem of limited sources of genomic DNA. In general, these methods are sufficient for end-point molecular evolutionary studies. **Methodology :** To investigate genetic diversity in a bacterial population, we measured the copy numbers of simple sequence repeats, or microsatellites, in *Mycobacterium leprae* from patients of Uttar Pradesh, where pockets of endemicity have been observed. One microsatellite loci containing trinucleotide (TTC) or a minisatellite with hexanucleotide repeats (*rpoT*) were amplified from biopsies from fifty patients, and the copy numbers were analyzed by sequence analysis. **Results :** Extensive diversity was observed in 50 patients, but closely related profiles were found for members of a multicase family and nearby areas likely to share a common transmission source. Different TTC genotypes were distributed among residents at the same dwelling in villages. A limited discriminative capacity of the TTC polymorphism in the epidemiological analysis implies the need of searching other useful polymorphic loci for detailed subdivision of clinical isolates. **Conclusion :** The inclusion of more loci in typing schemes is likely to improve the discrimination of this approach. In addition to further exploration of microsatellite diversity, it will be important to search for other forms of genetic variation suitable for strain typing. Important goals will be to identify typing systems capable of providing reliable information about the transmission dynamics of *M. leprae* and to use these to assist in the search for interventions that will reduce the number of new cases of leprosy. **Keywords :** *M. leprae*, Evolutionary analysis, VNTR

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Assimilation of *M. leprae* Specific PCR Testing into Routine Clinical Work

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Introduction : The lack of an objective diagnostic test for leprosy, independent of clinical manifestations, is responsible for late diagnosis in many cases and is considered a cause for further spread of the disease. We have applied PCR for identifying *M. leprae* from slit skin smears, nose swabs and skin biopsies of human leprosy patients, family members and other contacts. **Methods :** Samples taken from subjects suspected as having leprosy, leprosy patients and contacts were examined using two methods: Ziehl-Nielsen stained samples were examined under a light microscope. DNA was extracted from the same samples. The PCR target was the *M. leprea* specific repetitive elements (RLEP). **Results :** Out of 52 subjects tested, 36 were found PCR positive. Of these 6 were patient contacts with no clinical evidence of leprosy. Lepromin testing was positive in 5 of them, and the one subject with negative lepromin was diagnosed 6 months later as suffering from sub-clinical LL. PCR was positive in all microscopy positive smears, and in more than 50% of microscopy negative smears. **Conclusions :** The detection of several new positive contacts carrying *M. leprae* DNA that couldn't be detected by clinical criteria, underlines the effectiveness of the PCR assay. Immunological correlation is required for the application of PCR results to the clinical diagnosis. The assimilation of PCR testing into our routine clinical work proved feasible and effective.

A Simple Method for Detecting Drug Resistant *Mycobacterium leprae* Based on DNA Microarray

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A simple method to detect mutations of the genome of *Mycobacterium leprae* which confer resistance to key drugs for leprosy, was exploited on the basis of a reverse hybridization system. A series of oligonucleotide probes corresponding to each mutation in *folP1*, *rpoB*, and *gyrA* for dapsone, rifampicin and ofloxacin resistance, respectively, were selected and fixed on a glass slide as capture probes, to develop a DNA microarray, termed the Leprosy Drug Susceptibility test DNA microarray (LDS-DA). Mutations in clinical isolates of *M. leprae* were successfully discriminated by the LDS-DA. Feasibility studies were conducted to evaluate the performance of the LDS-DA in two developing countries, Myanmar and the Philippines, where the leprosy burden is relatively high. The high concordance of results obtained by this method with the results of nucleotide sequencing, strongly support the applicability of the LDS-DA as a drug susceptibility test, in place of the conventional time-consuming procedure. This is the first report of the development and evaluation of a rapid and simple method for the simultaneous susceptibility testing of three front-line drugs for leprosy. **Key words** : Drug resistance, Dapsone, Rifampicin, Ofloxacin, Mutation, Reverse hybridization.

Possible Changes on Leprosy Classification Using ML Flow Test in Minas Gerais - Brazil

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This is a descriptive study of epidemiological, clinical and laboratorial data on Leprosy, correlating sex, age, number of skin lesions and nerves involved, WHO impairment grading, skin smears and type of health facilities with the ML Flow result and WHO classification. It was carried out from October 2002 to March 2004, involved 1,072 patients in 13 municipalities of Minas Gerais State. Patient with positive BI and/or positive serology was classified as MB. The association of seropositivity with the variables was analyzed through logistic regression. The seropositivity (50.7%) was correlated with patients over 14 (OR:2.6), >5 skin lesions (OR:7.5), >1 nerve involved (OR:2.4) and positive BI (OR:5.5 to BI<2; OR: 191.2 to BI≥2). From 2000 to 2004, the MB rate decreased from 78.1% to 65.8% in Minas Gerais. The difference between PB and MB rate in participating and non-participating health services was statistically significant, indicating a direct and beneficial impact on this enemy in Minas Gerais. **Key-words** : Leprosy, classification, serology, skin smear.

Uptake of Clofazimine by Mouse Peritoneal Macrophages and the Effect of the Drug on Lysosomal Enzyme Synthesis

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Objective : To study the uptake of clofazimine (3[p-chloroanilino]-10-p-chlorophenyl 2,10-dihydro-2-isopropylimino phenazine) [CAS 54-85-3], an anti-inflammatory as well as antimycobacterial drug, by mouse peritoneal macrophage cultures exposed to various concentrations of the drug for 72h and to evaluate the effect of accumulated drug on the lysosomal enzyme levels in the macrophages.

Materials and Methods : Peritoneal cells were harvested from normal unstimulated Balb/c mice (weighing 20-25 g) and cultured by standard method. The cultures were exposed to clofazimine at concentrations of 0.1, 0.3, 0.5, 1, 2, 3, 5 and 10 µg/ml for 72 h. Cycloheximide at a concentration of 0.5 µg/ml was added in parallel cultures treated with 0.3 and 0.5 µg/ml of clofazimine respectively. Clofazimine concentrations in the cell lysates were determined by the HPTLC-densitometric method. The activities of two lysosomal enzymes - α-galactosidase and α-glucuronidase were assayed in the cell lysates. The protein concentrations of the cells were also determined.

Results : The intracellular clofazimine content ranged from 0.06 to 7.80 µg/ml corresponding to exposure concentrations. Uptake occurred equally well with dead cells. Exposure of macrophage to 0.1-1.0 µg/ml resulted in significant increase in the activity of both the enzymes although the increase was only moderate with 0.1 µg/ml concentration. Cycloheximide, at 0.5 µg/ml concentration, inhibited the clofazimine-induced increase in the level of both enzymes in the macrophage cultures exposed to 0.3 and 0.5 µg/ml of clofazimine. **Conclusion** : Clofazimine accumulates in significant amounts inside the macrophages and induces the de novo synthesis of lysosomal enzymes at concentrations close to therapeutic plasma levels of 0.3-1.0 µg/ml.

Genetic Analysis of Mexican *Mycobacterium leprae* Strains

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Introduction : We have shown that the genotype with four copies (4c) of the six-base tandem repeats in the *rpoT* gene was predominant in Mexico, and different to isolates from Peru and Paraguay, which presented the 3c genotype. This different distribution might reflect the effect of human race movements on the spread of leprosy. Here, we analyzed more strains from the Northwest of Mexico, for *rpoT* and SNPs genotypes. As well as mutations relevant to drug resistance (DR). **Methodology :** DNA from clinical samples was amplified by PCR with primers for the *rpoT*, SNPs and *folP*, *gyrA* and *rpoB* genes for DR. Products were analyzed by electrophoresis (*rpoT*) or direct sequencing (SNPs and DR). **Results :** of 10 samples analyzed, seven showed the 3c *rpoT* genotype, whereas only three the previous predominant 4c pattern. SNPs genotype from five samples was type 3 (CTC), showing correlation between the SNP and *rpoT* genotype. No mutations for DR were found in five samples analyzed. **Conclusions:** as expected, Mexico has several *M. leprae* genotypes. Further work to characterize strain from Eastern Mexico is under way. Although no DR strains were identified, sentinel surveillance should be impose to guaranty good implementation of treatment. **Key words :** *M. leprae*, genotypes, *rpoT*, SNP, drug resistance.

Gene Expression Profile and Evaluation of Unique Hypothetical Unknown Proteins of *Mycobacterium leprae* by Using Quantitative RT-PCR

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Diagnosis of leprosy is a major obstacle to disease control, and has been compromised in the past by the lack of specific markers. Using bioinformatics to compare the genome of *M. leprae* with other mycobacterial genomes in databases, up to 142 putative open reading frames (ORFs) have been identified as potential unique *M. leprae* proteins called hypothetical unknowns. Because of massive gene decay and prevalence of pseudogenes, it is unclear if any of these proteins are expressed or are immunologically relevant. To evaluate whether these genes produce a functional protein, we have performed cDNA based real time quantitative PCR to investigate the expression status of these ORFs. Out of the 142 ORFs, 23 showed significant level of expression compared to ESAT-6 (ML0049). Of these, 16 were cloned and expressed in *E. coli*, and polyclonal antisera raised to these were used to detect the native proteins in the subcellular fractions of *M. leprae* by immunoblotting. Candidate proteins identified in this manner are being screened for reactivity by serology and cell mediated response assays for their potential use in diagnostic development.

Recognition of Purified Microbial Products and *M. leprae* in Human Schwann Cells is Mediated by Toll-like Receptors

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We investigated the expression and function of Toll-like Receptors (TLRs) in human Schwann cells (SC), are an important cellular target in *M. leprae* infection. The human Schwann cell line (ST88-14) was found to constitutively express TLRs 4, 6, 5, 1, 2, 7, 8, 3 and 10 (in quantitative order) as assessed by real-time quantitative PCR; TLR9 mRNA was not assessed. The mRNA of MD2 and CD14 were well expressed. Surface expression of TLRs 1, 2, 4, 6 and CD14 was confirmed by FACS. We investigated the distribution of fluorescent chimeras of TLRs in transfected SC by confocal microscopy. TLR4 endosomal recruitment was observed within 4 hours of LPS exposure. In the absence of LPS, TLR4 positive endosomal structures were not detected. TLR expressing endosomes were observed in Schwann cells transfected with TLR2 or TLR9 within 3 hours of exposure to live *Mycobacterium leprae*. Schwann cells also were activated by a variety of other TLR ligands, consistent with their known TLR expression. Furthermore, live *M. leprae* induced the expression of IL-6 and TNF from the SC line. Quantitative PCR revealed that TLR4 mRNA levels were upregulated after LPS or live *M. leprae* stimulation. The neural lesion in leprosy is specifically related to *M. leprae* infection. The activation of TLRs in the innate immune response to *M. leprae* recognition seems to be a likely cause of nerve damage in leprosy.

The Utility of Measuring Serum Markers in Leprosy Patients During Multi Drug Treatment (MDT)

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We measured anti-PGL-I antibody, neopterin, and C-reactive protein (CRP) levels in serial serum samples from leprosy patients during MDT. Untreated leprosy patients, 15 multibacillary (MB) and 10 paucibacillary (PB), participated. The bacterial index (BI) in slit-skin smears was determined at diagnosis and blood samples collected at diagnosis and after 2, 4, 6 and 12 months of MDT. PGL-I antibody and neopterin were measured by ELISA and CRP levels by the latex agglutination method. PGL-I antibody and neopterin levels were higher in MB than PB patients, which correlated with their BI. The levels of CRP did not differ significantly between MB and PB patients. Eight patients developed reversal reaction and five developed erythema nodosum leprosum (ENL) during follow-up. Anti-PGL-I and neopterin levels were no higher in reactional patients. ENL patients had higher CRP levels than non-reactional MB patients. The PGL-I antibody levels declined significantly during MDT, in contrast to neopterin and CRP levels. PGL-I antibody and neopterin levels appear useful in distinguishing MB from PB patients. PGL-I antibody levels are useful in MB patients on MDT. CRP levels have some value in the detection of ENL reactions. **Keywords** : PGL-I antibody, Neopterin, C-Reactive Protein, Multi Drug Treatment, Leprosy.

IL-10 and NOS2 Modulate Cellular Dynamics in Leprosy Granulomas

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Mycobacterium leprae (ML) induced granuloma formation and maintenance depends upon T cells and macrophages and their respective cytokines. IL-10, a key regulatory cytokine, is generated by T cells and macrophages and inhibits IFN- γ production by T cells. IFN- γ is crucial for macrophage activation and induces NOS2 generation of nitric oxide, an important macrophage effector molecule. We have previously shown that NOS2 knockout (NOS2^{-/-}) mice generate an enhanced granulomatous response to ML and exhibit features of borderline tuberculoid leprosy. In this study, experimental leprosy was evaluated in C57Bl/6 (B6), IL-10^{-/-}, NOS2^{-/-} and IL-10/NOS2 double knockout (10NOS2^{-/-}) mice using both the Shepard model and the modified Lepromin Test model. Growth of ML was controlled in all of the strains. However, NOS2^{-/-} and 10NOS2^{-/-} mice exhibited increased FP induration and T cell infiltration into the FP granuloma compared to B6 and IL-10^{-/-} mice. ML antigen-specific, IFN- γ -generating CD4⁺CD44⁺ and CD8⁺CD44⁺ T cells were augmented in the NOS2^{-/-} FP, and these cells were enhanced even further in the 10NOS2^{-/-} FP. Thus, IL-10 and NOS2 can modulate the intensity of the cellular response in the ML granuloma and may play a role in regulating the pathologic granulomatous response at the tuberculoid end of the spectrum.

Pain Control of Leprosy Chronic Neuritis with Cyclosporine A is not Associated with Th1 or Th2 Cytokine Plasma Levels

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Leprosy chronic neuritis (LCN) is difficult to control in patients who do not respond well to prednisone, and there are few alternative drugs. Cyclosporine A (CyA) can control pain in these patients inhibiting the production of anti-NGF, which blocks NGF, a nociceptive, anti-inflammatory protein produced after nerve injury. Following our previous studies (*Lepr Rev* (2006) 77, 121-129), we now evaluated the presence of two Th1 cytokines, TNF- α and IFN- γ , and two Th2 cytokines, IL-4 and IL-10, plasma levels in these patients before and after CyA therapy. Plasma levels of these four cytokines were within normal limits when compared to control subjects, while the patients were taking only prednisone or after three months of 5mg/Kg/day CyA, after the complete removal of prednisone from therapeutics scheme. The mean period of time of LCN patients taking prednisone was 18 months. All but 2 of 15 patients had no pain complaints after three months of CyA use. These results suggest Th1/Th2 cytokines have no involvement in controlling LCN. The production of antibodies against NGF or other neurokinins may be responsible for these patients pain, which can be controlled by CyA. **Acknowledgements** : This work was supported by Secretaria Executiva de Saúde Pública do Estado do Pará (SESPA); by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq); by Financiadora de Estudos e Projetos do Governo Federal, Ministério da Ciência e Tecnologia (FINEP 1460/03) and; by Secretaria de Ciência, Tecnologia e Insumos Estratégicos do Ministério da Saúde do Brasil (SCTIE, MS).

Isolation of *Mycobacterium leprae* from Human Skin : Ultrastructure and Immune Response

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The *in vitro* culture of *Mycobacterium leprae* is still a challenge, which imposes restrictions for research on leprosy. Using a new enzymatic technique we can isolate and purify *M. leprae* from skin biopsies of multibacillary (MB) patients, allowing us to evaluate the bacilli ultrastructure and their interaction with immune cells. After diagnosis, a punch biopsy is done and the skin is kept in a disperse-RPMI medium for 5 days. After that, the specimen is submitted to two cycles of centrifugation. The first, at low speed, to remove debris, and the second, at high speed, to recover *M. leprae*, which is used for Scanning Electron Microscopy (SEM) analysis or interaction with macrophages previously isolated from peritoneum of BALB/c mice. SEM demonstrated homogeneous, 1.5x0.8mm, rod-shaped bacilli, with a rough surface, very similar to *M. tuberculosis* in culture. After 6h interaction of *M. leprae* with macrophages, supernatant levels of TNF- α raised from 2.4pg/ml to 98.2pg/ml, while IFN- γ had no difference. The experiments were performed in triplicate, and always in comparison to culture of macrophages alone. These results suggest this new technique can isolate and purify *M. leprae* directly from human skin, and these bacilli can be used in different experiments. **Acknowledgements** : This work was supported by Secretaria Executiva de Saúde Pública do Estado do Pará (SESPA); by Conselho Nacional de Desenvolvimento Científico e Tecnológico (PIBIC, CNPq); by Financiadora de Estudos e Projetos do Governo Federal, Ministério da Ciência e Tecnologia (FINEP 1460/03) and; by Secretaria de Ciência, Tecnologia e Insumos Estratégicos do Ministério da Saúde do Brasil (SCTIE, MS).

A Study on Various Approaches for Classification of Leprosy Patients into Multibacillary and Paucibacillary Groups

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A strategy for simplified classification method (based on presence acid fast bacilli in skin smear) into multibacillary (MB) and paucibacillary (PB) was initiated in 1982, followed by other approaches like lesion counts and serology. In this investigation we have compared the performance of all the three forgoing methods employing data obtained from 81 leprosy patients. On classifying leprosy patients according to lesion count criteria, 55.8 % (29/52) of MB patients and 89.7% (26/29) of PB patients were positive with the serological test. On the other hand, the sensitivity of the skin smear to classify lesion based MB patients was 17.3% (9/52) and for PB patients it was 96.6% (28/29). Regarding serological approach, the sensitivity of the serology to classify smear positive MB patients was 80.0% (8/10) and for smear negative PB group it was 66.2% (47/71). Thus, serological assay was able to detect highest proportion (24/71; 33.8%) of MB patients in the PB group classified by the other assays. However, there existed a poor agreement (kappa value varied from 0.105 to 0.394) among all the approaches (lesion count versus skin smear; lesion count versus serology; skin smear versus serology). Keeping the above information in view, we wish to suggest that follow-up studies need to be conducted to understand the efficiency of various classification approaches in preventing the occurrence of relapse after treatment. The method permitting the occurrence of lowest relapse would be worth adapting for its future use. **Keywords**: leprosy, serology, classification, treatment, management.

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Lipopeptide (LipoK) of *Mycobacterium leprae* Activates Antigen Presenting Cells and Type-I T-Cells

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Previously, we have identified one of the lipoproteins (LpK) of *Mycobacterium leprae*. Triacylated lipopeptide having the N-terminal 13 amino acids of LpK (lipoK) was synthesized and used to study the immunological relevance to leprosy. LipoK stimulated human monocyte derived dendritic cell to induce the production of Th1 cytokines IL-12 and TNF- α . Also, lipoK activated *M. leprae* infected dendritic cells and synergistically induced cytokine production. And this induction of cytokine was blocked by the pre-treatment of these dendritic cells with anti-TLR2 antibody. Significant up-regulation of HLA-ABC, HLA-DR, CD86 and the activation marker CD83 on these lipoK pulsed *M. leprae* infected dendritic cells was observed. Moreover when these activated dendritic cell were co-cultured with autologous CD4⁺ or CD8⁺ T cells, significantly high production of IFN- γ was seen. The effect of lipoK on monocyte derived macrophages was similar and the induction of IL-12 production was TLR2 mediated. LipoK activated *M. leprae* infected macrophages and induced the production of cytokines. The results indicate that lipoK could be an effective mediator of host defenses and a tool to find optimal immunotherapeutic strategies to fight against leprosy. **Keywords** : leprosy, lipopeptide, dendritic cells.

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Adaptative Hormones in Pathogenesis of Leprosy Neuritis

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The aim of the investigation is to study the role of adaptative hormones in pathogenesis of leprosy neuritis. **Methods** : 95 LL patients were observed, 18 of them with acute leprosy neuritis, 77 had no such signs during prolong period of observation. Using radio-immunologic methods there were defined the levels of hypophysis hormones in blood plasma (adrenocorticotrophic – ACTH), tireotropic (TTH); main hormones of adrenal cortex (cortisol, aldosterone). Acuteness of leprosy neuritis in most patients was predicted by significant increase of level of ACTH, TTH in comparison with beginning data, exhaustion of reserve of corticoproduktive function of adrenal cortex. The probability of development of such complication increased in synchronic increase of aldosteron level. In this situation the main mechanism may be non-specific stressor; overcooling, physical overpressure or psychic trauma. In some patients after physiologic load there were found decrease of ACTH production instead its sharp increase. Such patients had severe course of leprosy neuritis. Received results witnessed the special role of some adaptative hormones, including neuropeptides, in pathogenesis of neuritis. **Key words** : leprosy, neuritis, adaptative hormones.

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The Role of Tumor Necrosis Factor Production by Leukocytes in Formation of Visceral Complications in Leprosy Patients

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The aim of investigation is to clear up the role of the tumor necrosis factor alfa (TNF- α) production by leukocytes stimulated by *M. leprae* antigens in formation of visceral complications of leprosy. Leukocytes of 40 patients with lepromatous leprosy were cultivated in presence of antigens from *M. leprae* represented as sonicated *M. leprae* purified from infected tissues by Draper method. In culture supernatants there were detected the concentration of TNF- α by ELISA method. The level of cellular production of TNF- α was higher in patients with clinical and laboratory features of liver disfunction. Some of these patients had increase of *M. leprae* antibodies in blood. These results witnessed that some leprosy patients could demonstrate hyperreaction of leukocytes to *M. leprae* which leads to intensified production of TNF- α , inflammation and liver fibrosis. The possibility of such mechanism realization in leprosy is evident for taking into consideration the ability of *M. leprae* to persist in liver. The received results may be used in working out the ways of cytokine therapy in leprosy. **Key words** : leprosy, leukocytes, tumor necrosis factor.

The Effect of Conjugal Leprosy and Genetic Susceptibility on Vaccine Efficacy Estimates

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Despite advances in treatment and disability prevention, new case rates of leprosy have been slow to decline. Numerous studies have shown potential candidate vaccines for primary immunoprophylaxis. Estimates of genetic susceptibility to leprosy have been made from observational reports in familial settings using descriptive data. Risk of secondary transmission is presumed higher in family and household contacts. Conjugal transmission risk has been estimated between 1-10%, and generally thought to occur in 3-5% of spouses exposed to untreated lepromatous disease. Higher rates on conjugal leprosy have been described in populations with traditional familial intermarriage, possibly increasing the likelihood of genetic susceptibility and increased risk of infection within the population. Vaccine efficacy (VE) is calculated by comparing attack rates for a condition in vaccinated and unvaccinated groups. Genetic susceptibility or resistance to leprosy may affect VE calculation similar to that seen with differential susceptibility based on prior immunization or immunity following previous infection. Vaccine trials for leprosy should consider underlying genetic resistance to infection in study subjects. Development of markers for genetic resistance to leprosy might exclude the human population unlikely to benefit from immunoprophylactic measures, and provide susceptible individuals for whom a vaccine could prevent primary acquisition of this infection.

Description of HLA Alleles and Cytokines SNPS in Leprosy/AIDS Co-infected Patients : Preliminary Results

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Literature shows the role of HLA and SNPs on development of complex diseases such as leprosy and AIDS; however, there isn't data about these markers in leprosy/aids co-infected patients. Therefore, HLA alleles class I and II (-A, -B, -Cw, -DR e -DQ) and SNPs of cytokines (TNF- α , TGF β 1, IL-10, IL-6 e INFG) were identified to check the status of these markers in co-infected patients. **Methodology** : PCR-SSP, One Lambda Inc. (USA) commercial kit, was utilized for typing of 09 leprosy/aids co-infected patients between 1981 and 2006. **Results** : HLA alleles associated with both aids and leprosy were identified, but there was predominant association with aids. In respect to SNPs for cytokines, we also found compatible associations with both diseases, however, associations with leprosy were more frequent. **Conclusion** : HLA alleles in co-infected patients seem not to influence the clinical spectrum of leprosy, while SNPs of the evaluated cytokines are compatible with the clinical forms of leprosy. The presence of these markers didn't influence the clinical manifestation of any of the diseases in the studied co-infected patients, further studies are necessary to confirm this data. **Key-words** : leprosy, AIDS, HLA, SNPs, co-infection.

Serological Markers to Identify Nerve Damage in Multibacillary Leprosy Patients in the INFIR Cohort Study in India

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Introduction : The INFIR Cohort Study and was designed as a comprehensive project to identify predictors of reactions & nerve function impairment (NFI) in leprosy. The aim of the study was to look at various serological markers in MB leprosy patients and to evaluate their role as potential markers to predict reactions & NFI. **Methodology** : 303 untreated multibacillary leprosy patients from two centers in North India were the study subjects. The serological parameters tested in the serum at the time of intake of patients (baseline) were- antibodies to the *M. leprae* antigens PGL & LAM and antibodies against nerve component S100. The methods for serological measures were basically Indirect Enzyme Linked Immunosorbent Assay. **Results** : Results reveal that mycobacterial antigens have a significantly different immunological response across the Ridley-Jopling (RJ) classification. Antineural antibodies to S100 showed a significant increase as compared to anticardiolipin antibody. Serological measurements in patients with and without old and new sensory and motor nerve function impairment showed that PGL- IgG, LAM-IgG1 and S100 antibody were significantly associated with old sensory NFI. **Conclusion** : These results reveal that the antibody response to mycobacterial and nerve antigens are in a dynamic flux and collectively contribute to nerve function impairment in leprosy. **Keywords**: PGL, LAM, S100, Leprosy, Nerve damage.

Effect of Methyl Prednisolone on TNF- α Release in Cultured PBMC's of Treated Leprosy Patients

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Introduction: Glucocorticosteroids exert anti-inflammatory and immune suppressive effect by inhibiting the expression of cytokines and adhesion molecules. Steroids are widely used to treat leprosy reactions and prevent nerve damage. The present study was carried out to evaluate the in-vitro effect of steroid on TNF- α production in cultured PBMC's of treated leprosy patients. **Methodology :** PBMC's were isolated from 16 leprosy patients and 7 controls and were cultured and stimulated with Methyl Prednisolone (MP), Vitamin D3 & EB 1089 at optimum concentrations. TNF-alpha was estimated by Sandwich ELISA. **Results & Discussion :** 89% of patients showed >50% inhibition & 11% showed < 50% inhibition with methyl prednisolone. Inhibition patterns of Vit D3 and its analogue EB 1089 were similar in patients; majority of them showing < 50% inhibition. Vit D3 showed a significant difference in response. The level of inhibition of TNF- α using methyl prednisolone is high and shows no difference between patients and controls. 11% of patients showed <50% inhibition- which may be related to steroid non-responders. Though Vit D3 shows less inhibition, it shows significant difference between leprosy patients and normal controls which could be due to variation in Vit D3 metabolic pathway. **Conclusion :** Methyl Prednisolone shows good inhibition and is the first choice in immunosuppressive therapy. Vit D3 could be an additional anti-inflammatory therapeutic agent in leprosy. **Keywords :** Methyl Prednisolone, TNF- α , PBMC, Leprosy.

Auto Antibodies to Myelin Protein Zero (MPZ) in Leprosy Affected Individuals

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Introduction: Autoimmunity to nerve components has been implicated in various peripheral neuropathies and leprosy (Vardhani et al, 2003). Myelin Protein Zero (MPZ) is an intrinsic, structural membrane glycoprotein that comprises 40%-80% of peripheral nerve myelin. The present study was undertaken to determine whether leprosy nerve damage is associated with loss of myelin and production of antibodies to its components. **Methodology :** MPZ was isolated from peripheral nerve by Con A column chromatography and the protein was coated onto the ELISA plates. Antibody to MPZ was quantitated in serum by Indirect ELISA in 88 long standing treated leprosy affected individuals. Demyelination in leprosy nerve was evaluated by Immunohistochemistry using monoclonal antibodies to the extracellular domain of MPZ. **Results & Discussion :** The results showed that treated leprosy patients have significantly higher antibody levels (1.45 ± 0.57) as compared to normal subjects (0.48 ± 0.35). Immunohistochemical staining for Myelin P0 carried out on leprosy nerves, showed various stages of myelin degeneration in leprosy nerves, correlating with nerve histopathological observations. Immunohistochemical studies of Myelin P0 suggest that it is a good marker for demyelination and can be used for leprosy and other peripheral nerve degenerative diseases. **Conclusion :** The finding of this study suggests that MPZ could be an important molecule in the pathogenesis of neuropathy. **Keywords :** Autoimmunity, Myelin P zero, Leprosy, Neuropathy.

Intracellular Killing of *M. leprae* by Biological Chimeric Nanoparticles – A Novel Hypothesis

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Introduction : Leprosy is a chronic infectious disease caused by *Mycobacterium leprae* and is still a major health problem in several countries of Asia, Latin America, and Africa. Global efforts to control leprosy by intensive chemotherapy have led to a significant decrease in the number of registered patients. However, drug resistance has been reported since 1964 for dapson, 1976 for rifampin, and 1996 for ofloxacin. To prevent the emergence and transmission of multidrug-resistant (MDR) leprosy and treat existing cases of MDR leprosy, it is necessary to establish more efficiently drugs using novel technologies. **Methodology:** Construction of biological chimeric nanoparticles for killing of intracellular *M. leprae* can be used as a novel approach in Nanobiotechnological researches for drug design. These nanoparticles are constructed using the killer mycobacteriophages targeted for specific receptors on the cells containing mycobacteria. Consequently, the nanoparticles can arrive to intracellular microorganisms and kill them in their positions, efficiently. **Conclusion :** This methodology can be considered not only for treatment of leprosy, but also for construction of novel drug delivery systems for other infectious diseases. The chimeric particles will also improve our knowledge about the production of novel antibacterial agents against MDR strains of other fastidious bacteria. **Key words :** Chimeric Nanoparticle, Mycobacteriophage, Nanobiotechnology, *M. leprae*.

The Level of Immunoglobulins (IgA, IgM, IgG), Lysozyme and pH in Saliva in Patients with Leprosy, Compared with a Group of Matched Control Subjects

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There are currently 2599 registered leprosy patients in Turkey. Our surveys indicate that the leprosy patients who live in Turkey have the worst oral health condition. Also whole saliva is a very important factor in the homeostasis of the mouth. Antimicrobial agents (antibody and non-antibody) present in human saliva protect oral tissues by a variety of mechanisms. **Materials and Methods** : This study was conducted in the dental clinic at Istanbul Leprosy Hospital. The control group was selected from healthy people who is non-leprosy employee in Istanbul Leprosy Hospital. The aim of the present study was to determine the level of lysozyme, IgA, IgM, IgG and pH in the saliva collected from a total of 30 patients with leprosy. The patients were categorized according to type of leprosy (25 LL, 5 BL). 10 patients with LL leprosy and two patients with BL leprosy had severe type II (ENL) reaction. **Results** : There was no difference in IgG, IgA and Lysozyme levels in the saliva between the leprosy and healthy groups. However, The mean values of IgM was significantly higher in saliva from patients with leprosy diseases compared with healthy controls. Also salivary pH level with healthy group was significantly higher than leprosy group. Salivary immunoglobulins (IgA, IgM, IgG), Lysozyme and pH levels in the leprosy patients were not significantly among the LL and BL groups. **Conclusions** : Most of the leprosy patients in Turkey live in the rural areas. Nearly all patients are very poor; The incidence of deformities in our patients is high, excluding them from regular employment and a source of income. It is important that we consider all possibilities to develop, implement and manage oral health programs for patients with leprosy. Also oral health status of economically and socially disadvantaged leprosy patients must be improved more importance in Turkey in the 21. century. **Key Words** : leprosy, IgA, IgM, IgG, Lysozyme, pH.

Thalidomide Does Not Interfere with the Activation of Complement

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Thalidomide is effective treatment of erythema nodosum leprosum (ENL). Its mechanism is not known. Many of the histological features of ENL, especially the detection of bacterial antigen, antibodies, complement, and neutrophils are suggestive of an immune complex hypersensitivity reaction. If ENL is initiated by immune complexes, activation of complement will facilitate inflammation. We investigated thalidomide's effect on complement. Serum from six individuals was incubated with zymosan or with a highly-purified-viable preparation of *M. leprae*. The *M. leprae* were harvested from nu/nu mice, treated with alkali, washed, and sonication. The serum-zymosan or serum-*M. leprae* preparations were incubated with 2 to 4 µg/ml thalidomide. [These concentrations are within the concentrations achieved *in vivo* for the treatment of ENL]. The CH50 titer of the serum was determined. The control preparations of zymosan and *M. leprae* activated complement. There was no significant difference between the CH50 Units in the controls and the CH50 Units in any of the concentrations of thalidomide assayed. Thalidomide does not appear to disrupt the pathophysiological contribution that may be made by complement in the ENL reaction. **Key words** : ENL, Thalidomide, Complement.

Loop-Mediated Isothermal Amplification(LAMP) for the Detection of *Mycobacterium leprae* from Slit-Skin Fluid

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For the establishment of a genetic diagnostic tool for *Mycobacterium leprae*, the LAMP assay was performed with simple freeze and boil DNA extraction from the slit-skin fluid. A total of 39 clinical specimens of *Mycobacterium leprae* from slit skin fluid of newly diagnosed patients were used in the LAMP assay. The sensitivity and specificity was compared with slit-skin smear results. A set of four primers comprising two inner primers and two outer primers, that recognized 6 distinct regions on the targeted RLEP gene sequences {GenBank accession number X17151 (RLEP1), X17152 (RLEP2), X17153 (RLEP3)} of *Mycobacterium leprae* (Mukai *et al.* 2006, US-Japan Cooperative Medical Science Program) were used for LAMP assay (Notomi *et al.*, 2000, Nucleic Acids Res). **Key words** : LAMP, isothermal amplification of mycobacteriae.

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Introduction : T cells exerting negative modulation of immune responses are currently designated as T regulatory cells (T_{reg}) and have been characterised to be CD4+ CD25+ cells with a specific transcriptional factor FOXP3 (Forkhead box protein P3). The newly defined T regulatory (T_{reg}) cells would have immediate relevance for understanding the leprosy spectrum and T cell unresponsiveness in leprosy. This study aimed to localize the expression of FOXP3 in paraffin embedded skin lesions of leprosy. **Methodology :** Serial sections from formalin fixed paraffin skin tissue of leprosy cases were studied for the localization of T cells and natural T reg cells using CD3 and FOXP3 markers by immunohistochemistry. Super sensitive - Horseradish peroxidase (HRP) method was used. **Results and Conclusion :** Intense nuclear stain of FOXP3 indicative of T reg cells was observed mainly in the borderline tuberculoid as compared to lepromatous leprosy skin lesions. **Key words :** T regulatory cells, FOXP3, CD3, human leprosy.

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Introduction : Leprosy in HIV+ patients is not so frequent even in Brazil, where both diseases are endemic. However, after HAART introduction for HIV+, their immune condition has changed and those patients should be observed carefully looking for leprosy mainly when they report leprosy known contact (KLC). The objective is to evaluate the KLC and its importance among HIV+ patients. **Methodology :** A cohort study was carried through in Vitória, Brazil, with 153 HIV+ patients. They answered a questionnaire and blood was collected from those that reported KLC. Anti-PGL-1 was evaluated among them by ML Flow. **Results :** Of the 153 studied patients, 48% were women and 52% were men. The mean of age was 42 and the mean of CD4 account was 418. HAART was being used by 116 (76%) and 37 (24%) not. KLC was reported by 31 (20%) and 122 (80%) not. Three patients (13%) from 23 tested showed ML Flow (+), however they had no clinical signs for leprosy. They are using HAART. **Conclusions :** HIV+ patients with KLC and ML Flow (+) should be monitoring for leprosy onset, once they have two conditions that can be considered as risk factors for leprosy: KLC and antibodies anti-PGL-1 production. **Key words :** HIV, ML flow, known leprosy contact.

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This cross-sectional study compared leprosy rapid tests detecting (1) IgM against PGL-I (ML-Flow test, KIT, Amsterdam, Netherlands) or (2) IgM, IgG and IgA against PGL-I (ML-ICA, Yonsei University, South Korea). Whole blood and serum from untreated multibacillary (MB; n=50) and paucibacillary (PB; n=48) leprosy patients (Reference Center for Diagnosis and Treatment, Goiânia, central Brazil), MB household contacts (HHC; n=35) and healthy endemic controls (EC; n=50) were tested. Leprosy patients were classified by dermato-neurological evaluation, bacillary index (BI) and histopathology. Median age was 29 years, 39.9% males. MB patients had BB-BL-LL leprosy (median BI=2.0), PB patients had TT-BT leprosy.

Anti PGL-I Positivity (%)

Category	ML-Flow		ML-ICA	
	Whole Blood	Serum	Whole Blood	Serum
MB	84%	94%	48%	90%
PB	31%	44%	0	19%
HHC	0	31%	3%	20%
EC	0	2%	0	0

Strong seropositivity (≥ 2) in ML-Flow and ML-ICAs in MB patients was 22% and 26% and in PB leprosy 8% and 15%. ML Flow positivity in whole blood and serum of MB and PB patients was higher than ML-ICA positivity. Funding : The Heiser Program for Research in Leprosy and Tuberculosis for IDEAL Consortium. **Key Words :** anti- PGL-I rapid tests.

A New Mycobacterium Species Causing Diffuse Lepromatous Leprosy

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Diffuse lepromatous leprosy (DLL) with Lucio's phenomenon was originally described over 150 years ago in Mexico by Lucio and Alvarez. It is characterized by a distinctive necrotizing skin reaction in non-nodular leprosy, and affects individuals primarily in the Sinaloa and Jalisco provinces of Mexico, Costa Rica, and countries in the Caribbean. From an individual who was diagnosed with DLL at a clinic in Phoenix, AZ, mycobacteria were purified from skin lesions, lung, and lymph nodes, and DNA was isolated for genetic typing. The antibody titer to the *M. leprae*-specific PGL-I was very high (50% endpoint, 1:1,500), although reactivity to only 3 out of 6 *M. leprae* recombinant proteins indicated an unusual pattern for a lepromatous patient. Sequence analysis of genes from two individuals with DLL revealed that the 16S rRNA gene diverged by 2.1% and contained a unique sequence, while five other genes mismatched by 6-14% when compared to that of the TN strain of *M. leprae*. Phylogenetically, using evolutionary trees for a number of sequences, it appears that this mycobacterium evolved from a common ancestor with *M. leprae* that had branched off from other mycobacteria. These findings may have implications for the research, diagnosis and treatment of DLL. **Key words** : diffuse lepromatous leprosy, Lucio's phenomenon, 16S rRNA.

Application of New Serological Test for Leprosy in Vietnam

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Since early detection and rapid medication is important for leprosy control, serodiagnosis is very useful to detect *Mycobacterium leprae* infection. We have established new serodiagnostic test using major membrane protein-II (MMP-II) as antigen for detecting leprosy infection. So, in this study, we conducted serological survey of leprosy patients, their contacts, healthy individuals living in the central part of Vietnam. Although Vietnam attained the WHO's leprosy elimination target of less than 1 per 10,000 population in 1995, the number of newly detected cases in the year 2006 was still 666. We measured anti-MMP-II IgG antibody level and anti-PGL-I IgM antibody level in sera from 224 leprosy patients, their contacts and 211 healthy controls by enzyme linked immuno-sorbent assay (ELISA). The percent positivity by MMP-II ELISA was 85% for multi-bacillary leprosy (MB). For pauci-bacillary leprosy (PB) where cell-mediated immunity predominates, 47.0% showed positive results. Although, the positive rate of PGL-I ELISA were almost similar in both MB and PB to those of MMP-II ELISA. These results suggest that MMP-II antibody detection would facilitate diagnosis of leprosy.

Type 2 Reaction of Leprosy Hospitalized Patients at a University Hospital : Study of Immunological Mechanisms and their Clinical Expressions

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Introduction : Review of 133 files of Leprosy patients presenting type 2 reaction, admitted to our University Hospital, from 1979 to 1990, to assess clinical, epidemiological, immunological and laboratorial data. **Results** : Fifty percent of the patients were between 21 and 40 year-old, and the majority was female (57.9%). Lepromatous form was seen in 72.9% and borderline in 25.5%. Erythema nodosum late reactions were more frequently seen in the lepromatous form (71%) than in borderline form (44%). There was lower incidence of polymorphic erythema (13% and 32%, respectively). Lucio's phenomena were observed in 15.4% of lepromatous patients and in 23.6% of borderline patients. Immunoglobulin profile was similar in both groups. Articular commitment was seen in 55.6% of the cases. **Conclusion** : The combination of exams and effective clinical and immunological evaluation can help to monitor and to prevent the disabilities and neural injury. **Key words** : Type 2 Reaction: Leprosy; Immunology.

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It is already known that *M. tuberculosis* and *M. bovis* BCG induces expression of Coronin (TACO, tryptophan aspartate-containing coat protein), which is recruited into phagosome membrane depends on lipid raft of cholesterol during phagosome formation process. Thus, TACO suppresses phagosome-lysosome fusion when the mycobacterium invade into host. We tried to find out whether Coronin-1 protein will be influenced with survival of *Mycobacterium leprae* (*M. leprae*) in phagosome. The expression of Coronin-1 protein was observed at both tissue section of leprosy patients and nu/nu mice foot pad injected with wild *M. leprae* by immunohistochemistry using home-made rabbit originated polyclonal Coronin-1 antibody. The expression and accumulation of Coronin-1 protein was observed on phagosomal membrane infected with live *M. leprae*, markedly different from dead *M. leprae* that showed scant or few Coronin-1 protein with immunofluorescence stain and immunogold labeling, in vitro assay with murine macrophage Raw 264.7 cell line. We also applied the Coronin-1 expression in murine Schwann cell line (SW10) infected with *M. leprae*, but the Schwann cell could not expressed Coronin-1 protein in spite of phagocytosis of *M. leprae*. It suggests that Coronin-1 expression appears unique function of macrophages. **Keywords** : Leprosy, *Mycobacterium leprae*, Coronin-1, Schwann cell

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Early detection of leprosy remains one of the major challenges in the control of the disease. Dysautonomy occurs in leprosy neuropathy and indicates early nerve lesion. On the other hand, the presence of anti-PGL-I antibodies has been considered as a measurement of disease in contacts. At the Leprosy Clinic, FIOCRUZ, Rio de Janeiro, active leprosy detection is performed by contact vigilance. A group of 25 co-prevalent cases (ie. contacts with leprosy on their first evaluation following their index case diagnosis) was evaluated. A high prevalence (20%) of both altered skin vasomotor reflex (44%) and presence of anti-PGL-I antibodies (46%) was observed on diagnosis. All of the patients were PB (diagnosed as indeterminate or borderline-tuberculoid), and such a pattern is not expected in this group of patients. Studying autonomic alterations in leprosy patients and their contacts has provided with new information to explain the evolution of leprosy neuropathy. Contact examination is fundamental for early detection of leprosy. **Keywords** : contacts, co-prevalent case, skin vasomotor reflex, PGL-I antibodies, autonomic neuropathy.

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This pilot study was undertaken to study the distribution of Short Tandem Repeats (STR) loci of *M. leprae* from nasal secretions of untreated smear positive MB cases. The study was carried out on untreated MB patients registered SIHR&LC, Karigiri from 2005-2007. Nasal swabs from untreated smear positive MB cases were collected in Sputolysin Reagent (a concentrate of Dithiothreitol) and *Mycobacterium leprae* DNA was extracted using DNeasy blood and tissue kit method (Qiagen). Distributions of Multiple sets of *Mycobacterium leprae* STR loci were studied by PCR-Direct Sequencing to identify different strain types of *M. leprae*. 13 sets of Short Tandem Repeats (STR) loci of *M. leprae* had been selected which provide partial typing capable of differentiating *M. leprae* isolates among 50 potential polymorphic STR identified in recent publications worldwide. The characterisation will define the transmission pattern among population from an endemic origin. The results will be reported.

P-101***M. leprae* Inhibits Apoptosis in THP-1 Cells by Downregulation of *bad* and *bak* and Upregulation of *mcl-1* Gene Expression**

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Virulent *Mycobacterium leprae* interfere with host apoptotic mechanisms. We investigated *M. leprae* and non-pathogenic *M. bovis* BCG induced expression of apoptotic genes in THP-1 monocytes. *M. leprae* did not induce apoptosis in THP-1 cells in contrast with BCG. BCG-induced cell death was accompanied by characteristic apoptotic DNA laddering in cells. Non-viable BCG had a limited effect on host cell death suggesting that BCG-induced apoptosis was a function of mycobacterial viability. *M. leprae* also activated lower levels of TNF- α secretion and mRNA expression than BCG. A time course of infection illustrated that *M. leprae* reduced Bad and Bak mRNA expression by 18 h post-stimulation, with a further decrease at 48 h. *M. leprae* infection resulted in downregulation of gene expression ratios, Bad/Bcl-2 mRNA by 39% and Bak/Bcl-2 mRNA by 23%. In contrast, live BCG increased Bad/Bcl-2 mRNA (29 %) but had a negligible effect on Bak/Bcl-2 mRNA. Heat killed BCG induced only a negligible (1–4 %) change in mRNA expression of either Bak/Bcl-2 or Bad/Bcl-2. Additionally, *M. leprae* upregulated the expression of anti-apoptotic gene Mcl-1 while, BCG downregulated Mcl-1 mRNA. We propose that *M. leprae* restricts apoptosis by downregulation of Bad and Bak, and upregulation of Mcl-1 mRNA expression.

P-102**Laboratory Estimation of Intoxication in Leprosy**

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The degree of intoxication in leprosy was studied with the help of clinoid degidration of blood serum (BS) effective in estimation of character and severity of pathologic changes in patient's organism. Additionally it was determined the content of BS molecules of middle mass, universal indicator of endogene intoxication using the method of UV-spectrophotometry in diapason of waves length from 200 to 320 nm. There were observed 87 patients with leprosy (12 in active stage, 75 – in regress) at the age of 40 and 87. Control was BS of donors. The morphologic picture of BS witnessed moderate level of intoxication. Structural markers of intoxication toxic platelets were observed in 82 patients. Maximal number of toxic platelets was observed in BS of leprosy patients with neurotrophic ulcers. Results of morphologic analysis were confirmed by data of biochemical observation of deproteinized supernatant of BS characterized by increased level of middle mass molecules with length of wave from 248 to 280 nm. It is known that the length of waves from 240 to 248 nm characterized the presence of substance of catabolic origin, 278–286 nm – parts of proteins containing aromatic aminoacids. So, the results demonstrate moderate degree of intoxication in leprosy and underline the fact that mostly it depends on complications of leprosy. **Key words** : leprosy, intoxication, laboratory diagnostic.

P-103**ML Flow Serologic Test Versus Bacilloscopy Results in Newly Detected Leprosy Patients**Sandra Lyon^{1,2}, Ana Claudia Lyon^{1,2}, Rozana Castorina da Silva^{1,2}, Silvia Helena Lyon de Moura¹; Maria Aparecida de Faria Grossi^{2,3}, Samira Bührer-Sékula⁴ and Manoel Otávio da Costa Rocha²¹Sanitary Dermatology Service, Hospital Eduardo de Menezes – Fundação Hospitalar do Estado de Minas Gerais – Belo Horizonte, Brazil;²Post-Graduate Program in Health Sciences: Infectology and Tropical Medicine – Universidade Federal de Minas Gerais – Belo Horizonte, Brazil;³State Coordinator of Leprosy Control in Minas Gerais, Brazil. ⁴Universidade Federal de Goiás, Brazil.

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Introduction : The aim of this work was to compare ML Flow serologic test and bacilloscopy results in leprosy patients.**Methodology** : A group of 135 patients with newly detected leprosy at a reference service in Sanitary Dermatology in Brazil was submitted to bacilloscopy (registered as bacillary index – BI) and ML Flow test (registered qualitatively and semi-quantitatively) at admission. **Results** : ML Flow test was positive in 57% of patients; bacilloscopy was positive in 35.9% of cases. Patients with more than five skin lesions had five times the chance of having positive ML Flow test result when compared to other patients.ML Flow result was positive in 100% of patients with BI > 2+ and in 93.5% of patients with positive bacilloscopy. Patients with BI > 2+ had more than three times the chance of having a positive serologic test in high category (4+) in comparison to those who had low BI. **Conclusions** : There is a strong correlation between the results of serology and bacilloscopy results, which suggests that the ML Flow test may become a useful tool in clinical classification of leprosy. **Key-words**: Leprosy, ML Flow serologic test, bacilloscopy, diagnosis.

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Background : Leprosy reactions develop through abrupt changes in host parasite immunologic balance and resultant acute clinical exacerbations. Reactive oxygen species play a significant role in pathogenesis of leprosy and Multi-drug therapy demonstrably tends to normalise the resultant oxidative stress. Rifampicin and Dapsone have antioxidant action while clofazimine has both pro-oxidant and anti-inflammatory action. However, data regarding oxidative stress in lepra reactions and effect of drugs used in its treatment is lacking. **Objectives :** Aim of study was to assess oxidative stress in lepra reactions and determine its change with treatment of the reaction. **Methods :** From Dec 2006 to Mar 2008, a prospective study is being conducted in 40 patients with lepra reactions. MDA, FRAP and Reduced Glutathione were measured and comparisons of oxidant status and anti-oxidant capacity by assay of these parameters at inclusion, after 4 weeks of initial therapy (following standard guidelines including MDT, NSAIDS and cortico-steroids), and yet again 4 weeks after clinical remission were performed. Statistical analysis using repeated measure ANOVA and with Tukey's test was performed. **Results :** Upcoming trends in this study under process show no significant difference in oxidative stress parameters in tuberculoid and lepromatous pole with reaction. Oxidative stress is towards higher side in patients with active nerve damage. After 4 weeks of follow up, oxidative stress parameter (MDA) continues to increase and anti-oxidant level (FRAP, Glutathione) continues to decrease despite treatment. With the clinical remission of reaction, all these parameters show a significant improvement. **Conclusions :** Oxidative stress correlate well with nerve damage and improves after successful completion of treatment of reaction. **Key words :** oxidative stress in lepra reaction, MDA, FRAP, Glutathione, NSAIDS, Corticosteroids.

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The absence of a reliable source of *M. leprae* suitable for leprosy research has been a major obstacle in the study of this disease for >130 years. Highly viable (and irradiated) purified *M. leprae* are needed to address the complex immunological and cell biology questions that define the fascinating relationship between *M. leprae* and its host cells and shed light on the unique pathogenicity of leprosy. The NHDP-LRB has devoted considerable effort to routinely providing *M. leprae* as a reagent and characterizing the concept of "viability" in *M. leprae* harvested and purified from the nu/nu mouse foot pad. We have developed a "programmed passage" schedule permitting the harvest of billions of bacilli weekly that are 80-90% viable, a level unprecedented in the history of leprosy research. We have made >500 express shipments worldwide to over a dozen researchers. Qualified researchers are invited to request this valuable research reagent from the NHDP. Shipments of 1 – 2 billion can be handled routinely. **Key Words :** *M. leprae*, Mouse foot pad, Purified, Viable, Provision.

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Aim : A study therapeutic effect of horseradish root combined with potassium iodine in experimental leprosy. **Material and methods :** CBA mice, inoculated with *M. leprae* isolated from leprosy patients. Determination of neutrophil myeloperoxidase activity, blood count and assessment of hepatic function by AST and ALT – activity, *M. leprae* count in mice foot-pads. **Results:** combined therapy per os had a higher antimicrobial effect as compared to monotherapy with peroxidase – containing horseradish root. Combined administration of horseradish root and iodine activated myeloperoxidase in blood neutrophils, had antiinflammatory action, stimulated cell-mediated immunity, showed no signs of anemia and toxic effects of mice liver. **Conclusion:** proposed approach to therapy of experimental leprosy increases activity of myeloperoxidase system, which is one of the main bactericidal systems of phagocytes and might be used in complex therapy of leprosy. **Key words :** experimental leprosy, horseradish root, potassium iodine, phagocytic activity, haemogram.

Viable *Mycobacterium leprae* Does not Induce Apoptosis in Infected Murine Macrophages

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The principal host cells of *M. leprae* are macrophages and Schwann cells. A number of studies have reported that *M. leprae* induces apoptosis in their host cells. This is not consistent with our studies with murine macrophages where even a heavy intracellular burden of *M. leprae* had essentially no adverse effect. We suspect that the purity and viability of *M. leprae* used might be the cause of these divergent findings. In this study we explored the effect of freshly harvested nude mouse foot pad derived live and irradiated *M. leprae* in inducing apoptosis in infected macrophages. Apoptotic cells were determined by annexin V and TUNEL assays and also by staining for cells with activated Caspases. We also studied heavily infected macrophages from infected nude mouse foot pads. To further assess the role of *M. leprae* viability in induction of apoptosis, we incubated cells infected with viable bacilli at 37°C, as *M. leprae* rapidly loses viability at 37°C. Our results indicate that viable *M. leprae* does not induce apoptosis. However, loss of *M. leprae* viability induces apoptosis in infected macrophages. **Key Words :** *M. leprae*, Apoptosis, Macrophage, Viability.

Analysis of Plasma Proteome of *Mycobacterium leprae* Infected Mice

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Introduction : Plasma proteome profiling allows better understanding of the physiological state of the organism. Such profiles also provide the foundation for identification of candidate protein markers for the differential stages of the system. Since the onset of *M. leprae* infection in humans cannot be determined with confidence, studying the early responses to infection in human system is restricted. Footpad inoculated mice could be a good model system to study the early host responses to *M. leprae* infection. **Methodology :** Biopsy derived *M. leprae* was inoculated to the footpads and blood was collected at intervals from sixth month after infection. The plasma proteome was analyzed using two-dimensional electrophoresis and compared with appropriate controls. Differentially expressed proteins were identified by MALDI-TOF mass spectrometry. **Results :** Significant change in the expression levels of acute phase proteins like apolipoprotein A1 and haptoglobin was found in infected mice. The expression of the isoforms of apolipoprotein A1 was also differentially regulated. One of the isoforms was absent in plasma collected after 6-7 months of *M. leprae* infection; however this isoform was restored in the later stages of infection. **Conclusions:** A generalized inflammatory response to multiplication of *M. leprae* could be demonstrated by examining the plasma proteome. The ongoing study may help to provide new insights into the host pathogen interactions in leprosy and in the identification of early responses to infection. **Key words :** Plasma proteome, mice footpad inoculation, acute phase proteins.

Functional Analysis of sHSP 18 Antigen of *Mycobacterium leprae*

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Introduction : HSP18 is one of the major T-cell antigens of *M. leprae*, presumably a Heat shock protein. We have cloned and expressed the gene of HSP18 in *E. coli* and examined its functions *in-vitro* and *in-vivo*. **Materials and Methods :** sHSP18 gene of *M. leprae* was amplified from biopsy-derived cDNA of leprosy patients, cloned and expressed in pQE31 vector. Histidine tagged recombinant protein was purified with Ni-affinity chromatography. The purified proteins were run on a non-denaturing polyacrylamide gel (7.5%) to check self aggregation. *In-vitro* cross linking of the sHSP18 protein was also done using Glutaraldehyde (1%). For analyzing the effect of sHSP18 on thermal aggregation of *E. coli* soluble proteins, the cell extracts with or without HSP18 were heated at 100°C for 0, 20, 30, 40 and 60 min and centrifuged at 10,000 × g for 5 min at 25°C. The residual proteins were visualized by SDS-PAGE. The preheated HSP18 (100°C) was analysed for *in-vitro* chaperon assay using *Sma* I restriction Enzyme. **Results :** In the native gel analysis sHSP18 showed self aggregation and appears as a nonameric structure of 190-200 kDa size. The time course cross-linking with 1% glutaraldehyde shows that the 18HSP proteins are forming oligomeric structures of dimeric, trimeric, hexameric and nonameric forms. The M15/pQE31/18HSP cells demonstrated thermotolerance at 47.5°C. It also prevents thermal aggregation of *E. coli* soluble proteins. **Conclusions :** sHSP18 antigen of *M. leprae*, a small heat shock protein with conserved a-crystallin domains, forms multimers and we also could demonstrate for the first time, the *in-vitro* chaperon activity of this protein. **Key words:** *M. leprae*, Heat shock Protein, Chaperons.

Study of Cross Reactivity of *M. leprae* Reactive Salivary IgA with Other Environmental Mycobacteria

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Multidrug therapy has significantly reduced leprosy prevalence in most of the endemic countries. But the incidence is decreasing very slowly. Majority of the endemic population is exposed to *Mycobacterium leprae* but very few develop disease. This could be because of the development of protective immunity against the pathogen. Humoral mucosal immune response has been suggested to be quite important in the protective immunity. Presence of *M. leprae* reactive antibodies in the saliva has been reported earlier. As the endemic population is also exposed to many environmental bacteria, we tested saliva from 121 subjects for the presence of antibodies against other mycobacteria like *M. smegmatis* and *M. phlei*. We also checked for the cross reactivity of the antibodies. Saliva samples were cross-reacted with these two mycobacteria prior to testing *M. leprae* reactive antibodies by ELISA. In 59 subjects (48.76%) original saliva and cross reacted saliva showed same absorbance values (antibody levels) suggesting no cross reactivity. 26 subjects (21.49%) showed less than 25% drop in the O.D. values whereas 21 subjects (17.4%) showed 25 to 50% drop after reacting saliva with the mycobacteria. 15 subjects (12.4%) showed more than 50% drop in O.D. The data suggest that though large proportion of subjects had *M. leprae* reactive antibodies in their saliva that did not cross react with other mycobacteria tested, there were some subjects where salivary antibodies showed cross reactivity to different mycobacteria. **Key words** : cross reactivity of *M. leprae*, mycobacteriae.

Study of Cytokine Response Against Panel of Purified *M. leprae* Antigens by Whole Blood Assay in Subjects Residing in a Resettlement Village of Cured Leprosy Patients

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Mycobacterium leprae being an intra cellular pathogen, cell mediated immunity is very important in the clinical outcome of leprosy. Manifestation of the disease is correlated with the level and type of cell mediated immune response. The main objective of this study was to analyse TNF- α and IFN- γ production by T-cells when challenged with different *M. leprae* purified antigens in subjects with known exposure. 52 subjects residing in resettlement village of cured leprosy patients were included in the study. Whole Blood assay studies were undertaken in which the blood was placed in culture and was challenged with 35kDa antigen, whole *M. leprae* cells, *M. leprae* cell wall antigen, *M. leprae* cell wall antigen minus LAM and cytosolic fraction. T-cell derived cytokines TNF- α and IFN- γ were measured by ELISA. It was observed that challenging the lymphocytes with 35 kDa antigen, *M. leprae* cell wall antigen minus LAM and the cytosolic fraction resulted in increased levels of IFN- γ whereas challenge with 35kDa antigen and *M. leprae* cell wall antigen resulted in increased levels of TNF- α . **Key words**: cytokine responses, cured leprosy patients.

Genotyping of *M. leprae* and Study on Families with Multi-Cases

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Objective : Strain typing with MLVA on 7 VNTR loci (1) was applied to 84 *M. leprae* isolates from Qiubei County, Yunnan Province. The genotype of the isolates were traced to their village of origin and relationship to the index case, in multi-case families. **Methods** : All members in the family with a confirmed case were screened annually for leprosy and also the immediate neighbors of the index case (map). Phenogenetic analysis through application of PAUP 4.0, the isolates were grouped into A, B, C, D & E strains according to the allelic range of 9, 11-13, 15-26 and >26 on the (GTA)₉ locus. **Results** : The isolates with nine copies on (GTA)₉ are in Group A. The isolates from five multi-case families were from two northern townships GZ & GH of Qiubei. They belong to Groups A and B. One-fourth of the isolates (21/84) belong to cluster A and 8.3% (7/84) to cluster B. **Conclusion**: Genotype of isolates within a family are usually identical or nearly identical, but not between families. These results indicate that *M. leprae* belonging to Group A is the prevalent strain in Qiubei during this period.

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Decline in prevalence of leprosy in last few years has raised hopes of elimination and eventually its eradication. But the problems like early detection, determining efficacy of the treatment and differentiating relapses from the reactions can linger on and will also have a serious impact on the actual state of the disease in the community. Development of a tool, which could help answer questions related to *M. leprae* viability will aid to some extent effective elimination and also subsequent eradication of the disease. The present work aims at developing quantitative PCR technology using ribosomal RNA genes as a target. As a part of the strategy we used directional cloning method to clone a DNA fragment (171bp) coding 16S rRNA in *E. coli* SURE stain using pGEM 3Z plasmid vector. This fragment can be amplified using *M. leprae* specific primers. We also have cloned part of same fragment with internal deletion of 60 bp. The clones were screened by blue / white colony screening method using X-gal and IPTG and by colony PCR. Presence of fragment in the plasmid was confirmed by restriction digestion of the plasmid. The recombinant plasmids can be used to generate RNA in vitro which subsequently can be used as internal controls as well as standards in RT-PCR reaction for the quantization and quality control purpose.

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Introduction : Validated disease specific biomarkers could help in early diagnosis, monitoring disease- state, sub typing of disease and determination treatment efficacy. Discovery of biomarkers in leprosy would provide a unique approach to understand the disease and also provide better insights about disease predisposition in leprosy. The proteome of *M. leprae* has recently been examined, but studying the effect of *M. leprae* infection on host proteome has not yet been attempted. **Methods :** Serum proteome of leprosy patients across the spectrum and also reactional cases were examined and compared with that of healthy controls. After depleting the high abundant proteins, serum proteins were separated using high resolution 2D gels. Differentially expressed proteins were quantified using ImageMaster 2D Platinum software and identified by MALDI-TOF mass spectrometry. **Results :** Significant increase in one of the isoforms of α_2 chain of haptoglobin, an acute phase protein, was observed in ENL condition. In addition, Hp 0-0 phenotype (representing absence of haptoglobin) was detected in 21.4% of the ENL patients undergoing treatment, which on follow up examination showed typable phenotype, thus showing a condition of acquired anahaptoglobinemia (Gupta, N., Shankernarayan, N. P. and Dharmalingam K. (2007) Serum proteome of leprosy patients undergoing Erythema nodosum leprosum reaction: Regulation of expression of the isoforms of haptoglobin. *Journal of Proteome Research* 6:3669-3679). We also observed increase in another acute phase protein Orosomucoid (also known as α_1 -acid glycoprotein) in the serum of ENL patients. The study was extended to follow up examination of the same patients to check for response to the treatment. Changes in these two markers were shown to be correlated to the disease stage and they also respond to the treatment given. **Conclusion :** Haptoglobin negative condition reverted back to a typable haptoglobin phenotype after the patients were released from treatment. Interestingly the precursor protein of haptoglobin was also absent from the serum of all these patients. Validation of these observations will help in developing clinical assays for monitoring the disease course and treatment efficacy. **Keywords :** ENL, Haptoglobin, Leprosy, Orosomucoid.

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The nine-banded armadillo (*Dasypus novemcinctus*) is the only other animal, besides humans, that are naturally infected with *Mycobacterium leprae*. Armadillos, like humans, exhibit the full clinical spectrum, making it an excellent model for the study of disease progression in leprosy. Infection and subsequent loss of function of peripheral nerves is a hallmark of leprosy. Since previous studies have shown that the armadillo is a good morphological model of leprosy neuritis, the present study aimed to correlate loss of nerve function to the degree of infection. Change in the rate of impulse conduction velocity is the most important manifestation of abnormal nerve function. Hence, we determined nerve conduction velocity (NCV) in normal and infected armadillos, by surface stimulation of the posterior tibial nerve, distally at the ankle and proximally at the knee, and subsequent recording of compound muscle action potential. The mean distance between the two stimulation points were 4.47 ± 0.32 cm. Our results show that uninfected armadillos have a mean NCV of 87.21 ± 14.41 m/sec, with a mean distal latency of 2.26 ± 0.23 msec and a mean proximal latency of 2.79 ± 0.26 msec. Late stage infected animals had a longer latency and hence slower NCV.

Poster Presentations Epidemiology

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Ten Years of Detecting Leprosy Cases in Brazil

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Objective : To analyze leprosy trends in Brazil according to the historical sequence of the leprosy detection rates in the period from 1997 to 2006. **Material and Methods :** Ecological study of the trends in the historical sequence of leprosy cases diagnosed in Brazil in the period from 1997 to 2006, analyzing the detection rate per region and age group and utilizing data from the National System on Diseases of Compulsory Notification and from state leprosy programs. **Results :** The 36% reduction in leprosy detection from 3.3 to 2.1 per 10,000 inhabitants in Brazil over the last 10 years was verified. From 2003 on there has been a declining trend in general detection coefficients and in children under 15 years of age. **Conclusion :** One can conclude that an important decline in the leprosy detection rate has been taking place in Brazil over the past ten years, both overall and in children under 15. This trend is probably the result of initiatives that included the introduction of multidrug therapy (MDT) in 1987, of the strategy of increasing access to integrated diagnosis and treatment to primary healthcare services, and of efforts to change the image of leprosy within society. **Keywords :** tendency, detection rate, leprosy, epidemiology, Brazil

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Global Burden of Disease (GBD) of Leprosy in Brazil, Among Neglected Diseases (ND)

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Introduction ND : have not received enough attention, but are still responsible for important quality of life losses, especially in developing countries. **Objectives :** Our main goal was to describe the proportions and ranking of leprosy among ND in Brazil. **Methods :** The first National Brazilian GBD study was conducted in 2002-2004. Mortality was corrected for coverage, and garbage-codes and ill-defined causes of death were redistributed. Clinical-epidemiological parameters over 100 health conditions were collected by sex, age groups, and five great regions of Brazil. Disability-Adjusted Life Years (DALY) were estimated. **Results :** Among ND, leprosy was the fourth cause in ranking with 1,7%. In 5-14 and 15-29 age groups, leprosy represented 3,0% of the whole GBD for ND. Confirming inequality of the country, in two regions, North and Center-West Great Regions, both including the Amazon area, leprosy represented 5,0% of the total GBD for ND, and less than 1,0% in other three regions. **Conclusions.** Although the GBD for leprosy was low, it continues to be important in specific geographic areas and/or specific age groups.

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Detection of *M. leprae* in the Blood of Leprosy Patients and Healthy Inhabitants Live in Endemic Leprosy Area

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Introduction : AFB has been detected in Multibacillary Leprosy cases, indicated that bacillema is occurred. In endemic leprosy area, people are continuously exposed with *M. leprae* and these bacilli could reach the blood circulation. **Aim :** To detect *M. leprae* in the blood of leprosy patients and inhabitants of endemic leprosy area. **Methods :** Venous blood samples were collected from 52 new leprosy cases and 281 healthy inhabitants live in endemic leprosy area. PCR was performed to detect *M. leprae* in the blood, using Lp1-Lp4 primers. **Results :** *M. leprae* were detected in blood of 70% MB, 31% PB cases and 4% of healthy inhabitants of endemic leprosy area. **Discussion :** Bacillema in the blood of healthy inhabitants could be a preliminary process of infection, when the bacilli enter the body and reach the blood stream. **Conclusion :** Detection of *M. leprae* in the blood of healthy individuals indicates the early process of infection. **Key words :** *M. leprae* - blood - healthy contacts.

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Introduction : A Global Burden of Disease (GBD) Study was conducted in Brazil in 2002-2004. Clinical-epidemiological parameters were collected through a broad literature review, and epidemiological data, when available, for more than 100 health conditions, including leprosy. **Objectives :** Our main goal was to describe the incidence rates estimated for Brazil and its Great Regions. **Methods :** After corrections for underestimation of the Mortality System, and distribution of garbage-codes and ill-defined causes of death, clinical-epidemiological parameters for leprosy morbidity were checked for consistency through a free software DISMOD II, for estimation of Disability-Adjusted Life Years (DALY), by sex, age groups, and five great regions of Brazil. **Results:** Table 1 presents the rates estimated after consistency checking in Dismod II. Incidence rate of leprosy (GBD Code: IA10) by sex, age group and Brazilian Great Region.

	Sex	<1yr	1-4	5-14	15-29	30-44	45-59	60-69	70-79	80+
Brazil	Males	3,8	4,9	24,6	69,5	88,4	101,6	41,1	12,5	0,0
	Females	3,8	5,6	24,0	66,8	87,2	99,3	38,0	10,8	0,0
North	Males	8,9	8,9	58,6	185,7	185,7	253,2	0,0	0,0	0,0
	Females	8,9	13,5	55,9	130,8	206,7	236,2	137,6	40,2	0,0
Northeast	Males	1,8	2,7	11,3	26,2	41,4	46,6	27,0	8,0	0,0
	Females	1,8	2,7	11,4	26,4	41,7	47,5	27,6	8,1	0,0
Center-West	Males	3,3	5,0	23,4	78,9	132,4	149,5	87,2	26,4	0,0
	Females	3,3	5,0	23,5	79,0	133,3	152,5	89,2	26,7	0,0
Southeast	Males	0,7	1,0	4,6	14,4	23,7	26,7	15,5	4,7	0,0
	Females	0,7	0,7	4,4	21,4	21,4	29,8	0,0	0,0	0,0
South	Males	0,1	0,2	1,1	6,8	12,3	13,8	8,0	2,4	0,0
	Females	0,1	0,2	1,1	6,8	12,4	14,1	8,2	2,4	0,0

Conclusions : Although the GBD for leprosy was low, it continues to be important in specific geographic areas, such as North and Center-West Regions, especially in specific age groups.

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Secondary data on Leprosy cases in Adilabad district, Andhra Pradesh, India were compiled and analyzed (1991-2006). A total of 25196 new cases could be accounted from programme records since 1991. Proportion of multibacillary to paucibacillary cases is in the ratio of 4 : 6. Geographical distribution revealed clustering of cases in rural areas of the district followed by tribal and then urban areas. In the year 2006 the proportion of leprosy cases were observed more in scheduled class population than scheduled tribe. Although cumulative number of cases (prevalence) showed an descending trend between 1991 to 2006, there was plateau observed between 1994 to 1999 with a slightest peak in 1997. The declining trend from 2004 to 2006 suggests stabilization of prevalence rate and achievement of elimination target. However the new case detection rate is increasing proportionately and reached its peak in the year 2006 amounting to 70%. The reasons attributed to this increase were increase in awareness levels, strengthening of referral systems and integration programme in public sector. This analysis highlights that though prevalence rate is decreased new case detection rate is increasing at alarming speed and hence need to be addressed in future programme planning.

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Introduction : Duration Multi-drug therapy (MDT) regimen reduced from 24 months to 12 months may result in more relapses in leprosy patient. This prospective study was undertaken to document the pattern of relapse. **Methods :** 28 cases of leprosy presented with relapse from Jan 2003 to July 2007. These cases were confirmed histologically. **Results :** Among 28 cases of relapse, 79% were males and 22% were females. Clinical and histological classification correlated in 22 (79%) of relapsed cases. 23 were multibacillary (MB) & 5 were paucibacillary (PB) relapse. Minimum and maximum duration of relapse after release from treatment (RFT) in MB cases was 8 to 38 years respectively, while in PB cases it was 1 to 3 ½ years. 86% of the relapse cases presented with the same type of leprosy as seen previously. **Conclusion :** PB cases relapsed earlier than MB cases. Further long term follow up of MB cases is required. **Key words :** Leprosy, Relapse, MDT, Multibacillary, Paucibacillary.

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Introduction : This study was aimed at detection of viable leprosy bacillus in the soil from households of leprosy patients using For proof of viable bacteria, reverse transcribed RNA or complementary DNA and 16SrRNA gene amplification was used. **Methodology :** Soil DNA was extracted using TENP –Sepharose 4B column that successfully removed soil humic acid, an inhibitor for PCR. Recombinant plasmid pGEM3Z cloned with 116bp insert of known 16SrRNA gene (internal construct of 171 bp) was isolated and *in vitro*-transcribed to obtain RNA. This RNA was used as a standard against the unknown RNA of clinical samples in RT PCR assay. **Results :** *M. leprae* DNA was not detected in 50 soil samples collected from the households of leprosy patients. That the test was correctly performed was indicated by the presence of viable *M. leprae* in skin biopsies of leprosy patients as well as soil spiked with freshly obtained *M. leprae* from skin biopsies. **Conclusion :** Viable leprosy bacilli were not detectable in the environment of house hold of leprosy patients. Further studies are ongoing to detect viable *M. leprae* in soil samples collected during different seasons. **Key Words :** humic acid, 16SrRNA, *in vitro* transcription, leprosy.

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In 1937 W. H. Storm published the first document about leprosy in the Arabian Peninsula, since then different articles appears about leprosy in Yemen and gulf areas. At present except Yemen, Egypt, Somalia, Sudan, Pakistan and Afghanistan all the EMRO region members almost completely got rid of leprosy as health and social problem. The recently published epidemiological situation by WHO and the magnitude of Leprosy problem in EMRO who region will be discussed in this presentation with special concentration on the situation of countries in the Arabian peninsula.

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Introduction : Leprosy is no more a major threat. Having achieved PR 1 per 10000, zero PR is the next goal. A retrospective study was done at Sacred Heart Leprosy Centre, Sakkottai, South India to assess the leprosy scenario in immediate post-elimination period. **Method :** The clinical and microbiological status of new leprosy patients treated in OPD from January 2006 to December 2006 were analysed. **Results :** Total leprosy patients : 7588 New leprosy patients : 427 (M: 283, F: 123, C: 21) New Case Details: Treated for leprosy elsewhere : 277 Never treated before : 150 Smear for AFB positive: Adult : 49 Children : 2 Deformity pattern of new cases: Grade 0 Grade 1 Grade 2 Treated cases : 91 18 167 Untreated cases : 66 22 5 Children : 17 2 2. **Discussion :** This is a Referral Hospital with attendance from 12 districts and few neighbouring states. 427 new cases, Skin smear positivity 51, new children victims 21 and 27 patients with deformities among untreated cases run an alarming signal. High level vigilance and microlevel surveillance are needed. New smear positivity needs special attention. When they got infected?!! Missed? Having integrated leprosy to general stream, health system needs quality infrastructure to manage active cases and deformities in leprosy. **Key Words :** New cases, Smear positivity, Deformity.

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Introduction : Slit skin smear is the time tested simple laboratory tool and the gold standard for diagnosis of leprosy. A study was undertaken in Sacred Heart Leprosy Centre, Sakkottai, South India to analyse the smear positivity trend from 1991 to 2006. **Method :** All patients who underwent smear test were included in this retrospective study. As hospital policy, smear test was done to all patients before and after therapy and during follow-up. **Result :** Yield of skin smear Year Total smear Positive Negative Positive in done new cases (total new) 1991-1995 16267 2119 (13.0%) 14148 (87.0%) 735 (6302) 1996-2000 16904 1309 (7.7%) 15595 (92.3%) 490 (5160) 2001-2005 12220 722 (5.9%) 11498 (94.1%) 286 (3160) 2006 (1 year) 2140 105 (4.9%) 2035 (95.1%) 51 (150). **Discussion :** It is obvious that smear positivity shows decline. But 2006 has recorded 51 new positivity. This is the immediate post elimination period ? tip of iceberg,? when they were infected?!! This has to be addressed urgently with long time perspective. Highly active micro level surveillance needed. **Conclusion :** Smear positive cases are scattered. Regional centre for skin smear test is to be identified with special focus on new active patients. This will be a milestone to achieve a world without leprosy. **Key Words :** Slit Skin Smear, Positivity.

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Introduction : In most part of the world, 'males are affected more frequently than females often in the ratio of 2:1 in leprosy. LEPRA Society supported NLEP in Koraput and Malkangiri districts of Orissa in the year 1992. This paper presents the gender dimension of the total cases detected till July 2007 and compares with the findings of contact survey undertaken during 1993-2002. **Methodology :** During the period, the project has registered 17,854 cases among which 13042 are PB and 4812 are MB. Of them, the distribution of adult and child are 15440 and 2414 respectively. Sex distribution of identified cases was done year wise for the registered cases and contact cases both in case of PB & MB for adult and child. A consolidated gender analysis of these two groups is presented. **Results :** Out of 17,854 registered, 8088 cases are female (45%) which is almost equal to the rate of adult and child cases. It is found that in case of MB child which is about 6.8% of the total registered MB cases, the female percentage is 34% whereas it is 50% in case of PB cases. However, in the contact survey, the female percentage is higher than the male. In case of MB child the female percentage is 34% whereas the same is 60% in case of contact cases. On the other hand the female percentage in total registered cases is 45% and that is 55% in case of contact cases. **Conclusion :** The disease affects both males and females more or less equally. The higher percentage of female cases in contact group justifies that there is less and late reporting of female cases. It also concludes that voluntary reporting is also less in case of females **Key words :** Gender dimension, Contact survey, PB, MB.

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Introduction : Hansen's Disease is prevalent in all of states and Brazil has the second largest number of cases of this disease in the world. The first AIDS cases were notified in the 1980s, and as at 2005 403,145 cases were notified. AIDS and Hansen's Disease are compulsorily notifiable in Brazil on the SINAN (Notifiable Diseases Information System). **Methods :** In order to link AIDS and Hansen's Disease, the SINAN databases for both diseases will be used with REC-LINK software with specific keys for relating cases. **Results :** It is expected that by linking the AIDS and Hansen's Disease databases using appropriate software and methodology it will be possible to verify AIDS/Hansen's Disease coinfection, case under-reporting, in addition to implications regarding the clinical evolution of the diseases. **Conclusions :** Hansen's Disease, an endemic disease in Brazil, is predominant among the poorest populations. AIDS in the world and in Brazil is undergoing a process of pauperization, which is leading to an increasing number of cases of co-infection with consequences for clinical evolution, epidemiological data and the approaches used to care for these patients. **Key Words :** AIDS, Hansen's Disease, coinfection, SINAN.

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Introduction : This investigation study the territorial distribution of leprosy in Brazil in order to identify the regularities of its differentiation, and to contribute to the knowledge of the processes of its social production. Leprosy is a public health problem in Brazil, and its spatiality has been studied punctually, without systemization. **Methodology :** Time trends detection rates were calculated for regions and states of the country, during the 1960/2002 period. A geographical system of information was conformed to make possible the analysis of the spatial difference of the disease. **Results :** The North and Center West regions maintained the highest detections, the largest increments and defined the spatiality of leprosy in Brazil. The historical stability in the high incidence in the North, as well as the low incidence in the South, suggest the existence of geographical contexts with different vulnerability to the social production of leprosy. **Conclusion :** This results showed the expansion of the focus of leprosy in the North, Center West and North-East Regions, associated with the agricultural colonization in Legal Amazon and the development of some cities and metropolitan areas. **Key words :** Leprosy, Detection rate, Time trends, Spatial differentiation, Social production.

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Purpose was to monitor the course of leprosy during and after pregnancy. A cohort study followed 88 leprosy and 22 non-leprosy women during pregnancy and lactation for 15-28 years. Initial classification of leprosy patients was LL (27), BL (29), BT "active" (15) and BT "cured" (17). Treatment was: DDS monotherapy: 45/88, DDS with 2 years MDT: 30/88, DDS/Clofazimine: 4/88, DDS with other drugs 9/88. Most were released from treatment (RFT): DDS monotherapy in 1984 and DDS/MDT in 1986. 76% had one or more pregnancies after that. Analysis was by LL, BL, BT (Ridley & Jopling), and MB, PB. Evidence for "new" nerve function impairment (NFI) was loss of/deterioration in VMT, STG, facial sensation (FaSTG), corneal reflex (CR), and stocking & glove hypoaesthesia (SGH). New leprosy: 9 cases. 73/88 leprosy patients had relapse and/or new NFI after "cure"/RFT: **Relapse:** 23%MB, 37%PB; SGH: 86%MB, 44%PB; VMT/STG: 68%MB, 34%PB, 14%HC; FaSTG: 45%MB, 28%PB; CR: 34%MB (3 with blindness), 28%PB. Impaired VMT/STG and SGH in BL v. LL (all had MDT) indicate increased risk in immunologically unstable BL women of childbearing age. Women treated for leprosy need long-term follow-up even after MDT. **Keywords:** leprosy, women, pregnancy, nerve function impairment, Ethiopia.

Retrospective Analysis of ENL Cases Treated in an Urban Leprosy Project at Hyderabad

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In Hyderabad Urban Leprosy Project of LEPRA Society situated at Hyderabad, 13,406 cases of leprosy were registered for MDT during last 15 years. The case detection and registration was done according to National Leprosy Eradication Programme (NLEP) guidelines. All the cases were screened and put under MDT as PB and MB. Among the 13406 cases 2106 (16%) were MB. All the cases were followed up for a minimum period of three years. The follow up consists of clinical examination once in three months and bacterial examination once in a year. The clinical examination consists of looking for exacerbations of symptoms and nerve function assessment. Over this period of 15 years the definition of MB and duration of treatment varied in accordance to guidelines of WHO. A retrospective analysis of the data on 2106 MB patients was carried out and it was noted that 85(4%) patients developed ENL reactions. The ENL is managed with standardised regimen using prednisolone and Clofazimine depending on recurrence and severity. Patients showed reoccurrence of ENL - Five (5.8%) patients, for six times. Three (3.5%) patients 5 times, five (5.9%) patients 4 times, eight (9.4%) patients 3 times, sixteen (18.8%) patients 2 times and forty eight (56.4%) patients one time patients showed a reoccurrence of ENL. 56(65.9%) patients developed ENL reactions during treatment, 23 (27%) patients before treatment while 6(7.1%) were found with ENL reactions during the follow up examinations. Observations from analysis on age and gender distribution, recurrence of ENL and recovery status with reference to bacteriological status and nerve function assessment will be presented in the paper.

Social Epidemiology of New Leprosy Patients at the Skin Clinic, Office of Disease Prevention and Control, Region 5, Nakhonratchasima Province, Thailand Between 2002-2005

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The authors have conducted the social epidemiological research study of 46 new cases of leprosy who attended the special skin clinic of the office of disease prevention and control, region 5, Nakhonratchasima Province Thailand from 2002-2005. Data were collected by both quantitative and qualitative tools using designed forms and focus group discussion. Among total 46 studied cases, 29 were male, 17 were female who came from Nakhonratchasima (45.6%), Buriram (26.1%), Chaiyaphum (21.7%), Surin (4.3%) and Khonkaen province (2.2%) respectively. Thirty two percent of them have family history of leprosy. They were classified from the Ridley - Jopling classification and WHO-classification as multibacillary leprosy : MB (42 cases) and paucibacillary leprosy : PB (4 cases) whose 78.3% were acid fast bacilli positive from slit skin smears. Numbers of cutaneous lesions at clinical onset showed 1-5 lesions (17.4%) and over 5 lesions (80.4%). The other clinical onsets revealed anesthetic macules (65.2%) infiltrative skin lesions (21.8%), infiltrative mucous membrane of the nose (4.3%) and anesthetic hands and feet (6.5%). They were detected from several methods including referral system (32.6%), advice from neighbourhoods (23.9%), advice from relatives (21.7%), counseling from health staffs (13.0%) and attended clinic voluntarily (8.7%). The mean duration since onset to the time at first detection was 4.1 years while 13.1% were early detected before one year since onset as compared with grade two deformity-rate of 8.7 %. Previous antileprosy treatment were found among 32.6 percent who received drugs mostly from drug stores and medical clinics. Patients received and perceived previous leprosy knowledge from several sources and medias such as printed media (59.2%), mass media (22.2%) < personal media (14.8%) and the mobile rapid village survey team (3.7%). Study on psychosocial factors revealed from patients expression that 89.1 having fears and worrier of deformities and ulcer (24.4%) together with being afraid of spreading the disease to the other (12.2%) and unemployment (4.9%). Results from focus group discussion among those 6 cases who were earlier detected before one year since onset whose 66.6% were household contacts of index cases perceived that leprosy is hereditary disease (50%) meanwhile from 10 cases who were detected lately than one year confessed that they received previous treatment from near by health centers (80%) and drug store (20%). Authors have given recommendation to retain and better developed the special skin clinic as secondary care and referral unit for the Northeastern region in order to help supportive sustainable elimination of leprosy together with launching of mass education campaign and empowerment of integrated health workers.

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The epidemiological control actions of leprosy are based on the diagnosis and treatment of patients and on household contacts surveillance. Serological tests in leprosy could identify among contacts which of them have subclinical infection and a higher risk of developing leprosy in future. ML Flow is a serological test of quicker and easier execution which was applied in 2,840 household contacts of new cases of leprosy diagnosed from October 2002 to March 2004, in 13 municipalities of Minas Gerais state - Brazil. ML Flow was positive in 20.5% of leprosy contacts. Seropositivity was higher among males (22.4%, OR=1.25), people over 15 (21.7%, OR=1.38), people in contact with multibacillary cases (23.9%, OR=1.75), and people who lived in municipalities where the detection rate was very high (37.7%, OR=1.39). The interpretation of these results supports epidemiological concepts already known in leprosy, and indicates that the follow up of these contacts is necessary to evaluate the real role of seropositivity in the development of leprosy disease among contacts. **Key-words** : leprosy, serology, epidemiology, prevention and control.

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One hundred and eighty six cases of childhood leprosy cases were observed during the last decade. They comprised of 7.2 cases of leprosy cases and 0.1/1000 of the hospital outpatient population. Male female ratio was 2:1. Six percent of cases belonged to multi bacillary group (BL & LL). Nerve involvement was observed in 16.8% of cases. This group needs to be monitored carefully for impending paralysis. Reactions were not observed in children. On adequate follow up in 94 patients there was evidence of relapse in 3.6 % of patients.

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Leprosy in Brazil has been an important public health problem: the country diagnoses 90% of the cases in the Americas and it is the second country in absolute number of cases in the world. Among the natural premises of the leprosy geography we find the climate, the relief, kinds of vegetation and certain ecosystems. Among the social premises the unfavorable dimensions of life condition such as the economic, hygienic-sanitary, biological and behavioral are renewed within the social relations. The Amazon Region despite having only 10,4% of the country population, concentrates nearly 40,0% of the leprosy cases detected, presenting a coefficient of detection of 8,50/10 000 inhabitants, while the coefficient of the rest of the country is of 1,85/10 000 inhabitants, which shows its territorial focalization in the country. The state of Mato Grosso presents one of the most unfavorable situations of this region, maintaining high coefficients of leprosy detection in the last decade. Not disregarding the possible influence of the environmental and even operational factors, of the health services, this investigation intends to characterize the participation of migratory movements in the maintenance of the high coefficients of leprosy in the State of Mato Grosso. **Key-Words** : Leprosy, Detection rate, Space differentiation, Social production.

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This poster presents the proportional study of Reactions and Complications among the leprosy affected persons in Adilabad district of Andhra Pradesh. Adilabad Leprosy Eradication Project (ADILEP) is one of the direct projects of LEPRO Society started in 1997 to carry out NLEP activities in 21 NLEP centres. The study presents the analysis of newly detected reactions and complications cases from 2004 to second quarter of 2007 among 390 patients. From 2004 to 2007 around 100 new complications were identified among 390 leprosy new cases and 3490 surveillance cases. At the same time from the year 2000 to 2004 only 115 complications identified among 2300 newly registered and 3875 surveillance cases. It is observed that before 2004 the percentages of complication cases are in small numbers and after 2004 it is showing an upward trend. Around 54 new MB active cases and 24 type-I, 10 type-II and 24 neuritis were observed during 2004-07 period of time. It makes clear that due to discontinuity of active search the number of complications and reactions are escalating. Another interesting observation is that the prevalence rate by the end of 2003 was 4.3 per 10000 and current prevalence rate is 0.97 per 10000.

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Introduction : The issue of gender disparity is often talked about, due to the lower percentage of women availing leprosy related services. This disparity can mean that females are equally suffering but all are not detected or fewer females suffer from the disease as observed in some studies. In either case the subject is interesting, needs attention. **Methodology :** The present paper analyzes data on some epidemiological parameters related to female patients based on the observations from BOLEP, one of the LEPRO Projects in Orissa. The project has survey mode of case detection up-to 1998. Then special elimination campaigns were organized from 1998 to 2005. An attempt has been made to calculate the female specific NCDR, MB rate and disability rate and compared with annual percentages for a period of 16 years from 1991 to 2006. **Results :** The specific NCDR, MBR and DR are more informative when compared to mere percentages. It has been observed through years that percentage of female case varies greatly compared to the specific rate. For example in 2006 the female NCDR, MBR and DR are 40.4%, 32 and 0. The corresponding female specific rates are 2.7, 0.9 and 1% respectively. Similar to total NCDR, female specific case detection rate shows three sudden falls on the year 1992, 2002 and 2005. They seem to reflect more of change of strategy in case detection than disease behaviour. The percentages do not reflect the programme effects. Special campaigns (which are partly active mode of case detection) have not detected more female cases, which probably indicates lower incidence of disease in female. Disability and MB rates also do not seem to indicate late detection in females. **Conclusion :** Female specific rates are more informative and reflects the programme impact. Special campaigns did not show increase detection of female cases. **Key words :** Gender disparity, NCDR, MBR, Disability rate.

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Introduction : Psychological stress has been claimed to be one of the risk factors in reactions in leprosy. There is a lacunae in studies to explore the association between reactions and stress. Study results could lead to finding appropriate interventions in reducing the impact of stress events. The aim of this study was to ascertain occurrence of life stress events as a triggering factor in the onset of leprosy reactions, using a case control approach. **Methodology :** The cases included patients who have had reactions after the diagnosis of leprosy or even during the time of diagnosis. The control group was leprosy patients without reactions and should have completed up to 9th pulse of MDT. The stressful life events scale modified and standardized was used. The inventory items are clubbed into 12 different categories. **Conclusion :** Preliminary analysis indicates that occurrence of life stress events in the reaction group was higher than in the control group. The analysis is yet to be completed.

Clinico-Epidemiological Study of Pure Neural Leprosy From a Tertiary Hospital in Delhi

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Introduction : Pure neural leprosy (PNL) continues to be common in India. This form of disease is least studied and very little information exists in literature. We analyzed the demographic profile and clinical aspects of PNL at our center. **Methodology :** Retrospective analysis of confirmed PNL registered in leprosy clinic in our institute between January 2003 and July 2007 was undertaken. Demographic and clinical profile including onset of disease and presenting complaints, pattern of nerve involvement, presence of nerve abscess and deformities were analyzed. Investigations such as slit-skin smear (SSS), skin biopsy, electrophysiological study (EPS) and nerve biopsy were done. **Results :** Of 1975 leprosy cases seen during this period, 188 (9.5%) had PNL which included 160 (85%) males and 28 (15%) females, with 121 (64.36%) cases within 20-40 years. Presenting symptoms were paresthesia, pain, sensory loss and motor weakness. Majority of patients i.e 119 (63.3%) had e" 2 nerve involvement while 49(26%) had e" 5 nerve involvement. Ulnar nerve was most commonly involved in 130 (69.14%) cases followed by common peroneal in 91 (48.4%). Deformities included claw hand in 50 (26.6%), foot drop in 21 (11.17%) facial palsy in 2 and wrist drop in one patient only. Nerve biopsy revealed features ranging from normal, to infiltration with epithelioid cell granulomas, fibrosis, lymphohistiocytic infiltrate and AFB positive foamy histiocytes. EPS showed features of sensory/ motor axonal neuropathy, demyelination, denervation with poor to moderate reinnervation or decreased sensory nerve action potential. **Conclusions :** PNL is a distinct type of leprosy in India. Men are more commonly affected and ulnar nerve involvement is the most common manifestation. Sensory complaints are early and more common. Early diagnosis and treatment is helpful in preventing sequel due to nerve damage.

Spatial Distribution of Leprosy Among School Children in Paracatu, State of Minas Gerais-Brazil

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The detection rate of leprosy in the district of Paracatu is increased in people with less than fifteen years old, 6.8/10,000 inhabitants in 2003 (hyperendemic). The study aims the territorial distribution of the leprosy-cases in teenagers and school children, using the strategy of the case finding. A prospective cohort and ecologic study has been used with 16.623 scholars from January of 2004 till June of 2006. 68 cases of the disease had been diagnosticated (25.1%, multibacillary forms). About 85.2% lived in the urban area, 55.8% were women, predominating in an age group from 10 to 14 years old. There has been an increasing of 38.2% in the detection rate cases, giving visibility to the unknown prevalence. In considering of the case finding eight micro regions of Paracatu were distinguished. The geoprocessing of the information through the case finding among scholars, allowed a visibility of the high detection rate of leprosy by region in Paracatu-MG. **Key words :** leprosy, scholars, case finding, spacial distribution.

Subclinical Peripheral Autonomic Neuropathy in Contacts

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Early detection of leprosy is essential for treatment and control of the disease. Vasomotor reflex (VMR) evaluates small myelinated nerve fibers which are the first to be damaged in the disease. A total of 500 household contacts of multibacillary patients, aged 12-65 years, were evaluated in order to detect early manifestations of the disease. Laser Doppler fluxometry (LDF) and presence of PGL-I antibodies in serum were assessed. The analysis showed that 26.6% of the contacts had altered VMR and 24.2% had anti-PGL-I antibodies. Both tests were positive in 6.8% of the contacts. No association was observed between VMR alteration and anti-PGL-I antibodies. Most of the cases with antibodies anti-PGL-I (64.5%) and with altered VMR (59.4%) were contacts of lepromatous patients but no association between the variables was observed. VMR was more frequently altered in the fifth fingers than in the second fingers. Alteration of the peripheral autonomic function determined by LDF suggests sub-clinical infection in contacts. Further study of autonomic alterations can provide with new information to elucidate the pathology and evolution of neuropathy in leprosy. **Keywords :** contacts, vasomotor reflex, autonomic neuropathy, PGL-I.

Clinical and Epidemiological Profile of New Leprosy Cases Detected Through a Sample Survey in Greater Mumbai

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Mumbai is an important urban centre in India with 13 million people and about 60% are living in slums. The 'intermediate' goal of leprosy elimination (< 1 case per 10,000 population) is achieved in Mumbai (March 2005). The rate of annual decline in PR was 53% in 2005 as against the worldwide decline of 2 to 12 %. This calls for an enquiry. ALERT-INDIA maintains a 'central registry' of all new leprosy cases registered in Mumbai city to monitor the epidemiological trend in leprosy under Leprosy Elimination Action Programme (LEAP). A sample survey was undertaken to review the leprosy status in Mumbai authorized by Municipal Corporation of Greater Mumbai (MCGM). From January to September 2007, 154,200 (76%) out of 201,302 enumerated population in 8 Health Post areas randomly selected were examined by the trained workers of 4 NLEP units. 79 new leprosy cases (NCDR: 5.18 / 10,000 population) were detected from areas reported with a PR of 0 to 2 per 10,000 population. The clinical presentation, epidemiological features, duration of disease and knowledge about the disease of all these cases were assessed. It was observed that 56% of new cases had leprosy for more than 6 months before detection and 50% of them were residents for more than 5 years. The rest were migratory population from other states. The sample survey revealed existence of endemic pockets that need focused interventions.

Change in the Profile of Disabilities and Deformities in Leprosy

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An effective leprosy control measure means that every leprosy patient is detected early and cured without disabilities and deformities. Analyzing the incidence and prevalence of disabilities and deformities at the time of registration, during and after the course of treatment will help to provide feedback to service providers and programme managers. A field based retrospective analysis of 2178 records of leprosy patients' registered with the urban leprosy project of ALERT-INDIA for the period from 1985 to 2006 in one of the Mumbai suburbs was undertaken to ascertain the change in the profile of disabilities and deformities. The data were analysed mainly on 1) the clinical type of leprosy, 2) the type of physical deformity / disability and 3) change in the deformity / disability status. Out of the 2,178 leprosy cases studied, 281 (13%) reported with disability / deformity at the time of registration. The disability status after completion of treatment (RFT) and after completing the surveillance (RFC) was compared. Analysis of data showed changes in the disability / deformity status depending on quality care. Hence the need for a long-term care is emphasized. The role of effective support services by the leprosy trained personnel, training and equipping GHC personnel to identify and manage early disabilities / deformities and integrating specialized leprosy services into the general health system are stressed.

Incidence of Silent Neuritis and Identifying the Predisposing Factors in Leprosy

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It has been well documented that 'silent neuritis' occurs without pain, swelling and signs of inflammation as compared to acute neuritis in leprosy. Detecting silent neuritis due to leprosy at an early stage and managing successfully without loss of nerve function is most challenging even at the hands of experienced leprosy workers. The Leprosy Referral Centres (LRCs) established by ALERT-INDIA in the project areas (Mumbai and Navi Mumbai) under its Leprosy Elimination Action Programme (LEAP) provide support services for confirming diagnosis and offer comprehensive services to all leprosy patients referred by the GHC personnel. A longitudinal, observational study was undertaken to measure the incidence of silent neuritis and to identify the predisposing factors. 283 leprosy cases registered at LRCs during 2005 and 2006 were assessed every month for loss of sensory and motor functions of the nerves. The sensory function was tested using monofilament and the motor function was assessed using voluntary muscle testing (MRC scale). All these patients were followed-up for 2 years. 28 (10%) out of 283 cases were diagnosed with silent neuritis. The host (age and sex) and disease (number of skin lesions and its distribution) factors were studied. 90% of these cases were detected with silent neuritis at the time of diagnosis. It was observed that there is an association with the number and distribution of skin lesions. Male adults and middle age group cases are found to be more susceptible for silent neuritis.

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In Colombia, the consumption and contact with the nine banded armadillo (*Dasypus novemcinctus*) are common practices, ignoring the fact that this animal is reservoir of *Mycobacterium leprae*, the causal agent of leprosy, and can also suffer this disease. Methods Ear lobe biopsies of twenty two (22) nine-banded armadillos were studied during a period of 2 years. The biopsies were processed for DNA extraction and amplification by nested polymerase chain reaction (PCR), using the LP1-LP2 and LP3-LP4 primers. Biopsy extraction was performed without causing any pain and stress to the armadillos using a combination of Acepromazine and Lidocain. **Results** : Ten of 22 (45%) of nine-banded armadillos evaluated are positive hosts of *M. leprae*. It is necessary to do deeper investigations to find out if they are transmitting leprosy and establish what the symptoms they present if they are affected are. **Conclusions** : This is the first investigation about the presence of *M. leprae* in nine band armadillos used for consumption in a region of Antioquia State of Colombia. The leprosy transmission due to contact and consumption of the animal or its blood with therapeutic proposals, have to be investigated in deep.

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Introduction : The study was conducted to ascertain the registration status, time lag and reasons for non/delayed registration, pattern and sources of MDT, among new cases of leprosy, initially reporting to a tertiary level institution and subsequently referred after diagnosis, to Primary Care institutions. **Methodology** : All new cases referred from RLTRI, Raipur to three adjoining blocks between Nov. 2005 and Oct. 2006 were listed and followed at monthly interval at the PHC/CHC, Sub center and household level. **Results** : A total of 371 cases were referred, of which 326 (86.9 %) could be traced. The level of PHC/CHC registration of cases, which was 58 % after 2 months, rose to 80.4 % after 6 months of follow up. 82.9 % of the registered cases collected subsequent doses of MDT from the nearest SubCenter or PHC. Main reason for non/delayed registration were delay in reporting from patient side (30.7%), Non availability of MDT at PHC (24.1%), Non-availability of concerned staff (7.3 %) and other operational problems (38.0 %). **Conclusion** : The study highlighted the need to strengthen the "MDT Services" through monitoring and supervision of leprosy activities delivered by General Health Services in post integration phase. **Keywords** : MDT services, Leprosy, Description study.

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The Dominican Republic leprosy control program has detected 12,156 cases. 2,630 (22%) were children. The percentage of children with leprosy reflects the disease's transmission and the efficiency of control programme. This study was undertaken on 223 newly diagnosed leprosy children between 2000-2006. The children incidence rates decreased from 18% (2000) to 8% (2006). 90% of the children cases were six years old or older. The sex distribution showed no significant difference. 22 (55%) children presented only one lesion and 187 (84%) less than 5 lesions. 160 (72%) were Pausibacilar and 63 (28%) Multibacilar. Familial contact was the source of infection for 158 (71%) children, 95 (43%) were detected by contact examination and 55 (25%) children by other active surveys. The duration of the leprosy symptoms varied from one month to one year. Reactional episodes and disabilities were rare. The Dominican Republic leprosy programme has a sustained high percentage of children with leprosy. Probables causes are the country population and the active survey regularly performed. **Keywords** : Leprosy, children, *Mycobacterium*.

Epidemiologic Study in Estuary of Iguaçu-Paraná-Brazil, to Verify if to Hiper Endemic Disease of Leprosy in the City it is of Genuine Residents

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Introduction : Foz do Iguaçu places in the triplice region border with Argentina, Paraguay, Brazil, also is great tourist polar region, having intense flow of people in search of better conditions of life and work. Is the city of the state of the Paraná with the biggest number of new cases general and in minors of 15 years. The study epidemiologist it aimed at to clarify if detected cases were resident have 5 years more than (genuine resident), or mattered of the neighboring countries or other city of the State that migraram for the city. The study if it gave through domiciliary visit for confirmation of the residence informed for occasion of the registration in the Program of Control of Hanseniasis in the period of 2000 the 2005. **Methodology :** Historical Retrospect; Data-collecting in the SINAN (System of Information of illnesses of Notification); Domiciliary Visit in 734 addresses; Analysis of the data. **Results :** 514 domiciles had been visited and 434 (84.4%) had been found, of these, 278 (79.4%) had informed to inhabit in the city have 5 years more than. They inhabit in Paraguay 5 (1.48%) and 1 (0.30%) in Argentina, excessively the 18, 8% are Brazilian residents in other cities or with less than 5 years of residence. **Conclusions :** The data make possible to confirm as resident in the city, "resident" the informed cases of leprosy as. The number of users found at the moment of the domiciliary visit consists in an excellent information if not detecting false addresses. The service of leprosy of the city always took care of to resident people of other countries or cities, and the negation of the address revealed as not being cause to hiper endemic disease presented for the city. The people are received and know that they will be treated and this is given credit has contributed for the inexistence of false addresses. Therefore one concludes that the endemic disease can be genuine residents.

WORDS KEY: false addresses, triplice border, tourist polar region, domiciliary visit, genuine resident.

Leprosy and Immigration : A Study on the Occurrence of the Disease in Foreigners in Sao Paulo – Brazil 1924- 1943

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Leprosy is a disease, which incidence in Brazil can be traced since colonial times. Strong stigmatization and fear of infection contributed for the search of ways to segregate the patients from society by the government. However, only in the beginning of the 20th century, the real confinement took place through the compulsory confinement politics. The fast growth in number of patients in the State of Sao Paulo coincided with a period of great economic growth and arrival of a great number of immigrants during the first decades of the century, forcing the creation of a system of asylums big enough to accommodate all the infected people. Those asylums were run with strict organization and rigorous physical as well as bureaucratic control. The objective of this research was to analyze that disease's path and its incidence on different groups of immigrants. **Methodology :** We analyzed the specific bibliography on leprosy and immigrational movements, and medical articles. More than 7,000 medical records concerning patients admitted to hospitals in the State of Sao Paulo between 1924 and 1945 were analyzed. The incidence of the disease among different nationalities, gender and clinical form was also analyzed, and the data, compared to the one referred to the natives from the country. **Results :** We verified that leprosy would affect mostly the foreigners and their descendents born in Brazil, being those two groups responsible for 48% of the cases during that period; that the highest incidence was on males, which group was multibacillary in their majority. **Keywords :** leprosy, immigration, epidemiology.

A Novel View on Leprosy Epidemiology

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Detailed investigation of *M.lufu* isolated from the soil revealed a number of biological properties shared by *M.lufu* and *M.leprae*. It is shown that *M.lufu* are capable to induce a leprosy-like generalized disease in immune modulated mice with formation in the animal internals of macrophage granulomas with numerous mycobacteria inside macrophages. With using anti-*M.leprae* monoclonal antibodies (WHO Bank) a specific epitope common to *M.lufu* and *M.leprae* was found out. In *M.lufu* high DOPA-oxidase activity as well as other properties particular for *M.leprae* are found out. *M.lufu* preparations markedly inhibited *M.leprae* multiplication in foot-pads of mice. Protective effect of *M.lufu* is far higher as compared with vaccines based on BCG, *M.vaccae* and viable and killed *M.leprae*. Diagnostic tests for leprosy based on *M.lufu* antigen were developed. The data obtained permit to conclude that *M.lufu* is extra-organism part of the population of leprosy bacilli. We have good reasons to state that *M.leprae* are capable to survive autonomously in the environment outside of host organism, in particular in the soil. Since the soil, infected people and different vertebrate animals serve for natural life activity of *M.leprae* as pathogen, leprosy might be considered as saprozoosis. **Key words :** leprosy, saprozoosis.

Study of Prevalence and Correlates of Leprosy in a Highly Commercial Sex Area of Bihar – Muzaffarpur

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Introduction : Leprosy being a disease mainly of poverty, compromised hygiene and sanitation, is bound to affect Muzaffarpur. People belonging to this area are even reluctant to visit the hospital. Thus, door to door screening for leprosy by using diagnostic tools has been performed. This study will enable us to get a clear picture of the prevalence of leprosy among the actively involved commercial sex workers and their family members. This area covers a population of about 5200. It comprises of 1500 families. **Methods :** The study consisted of five teams whose job was to visit each and every family and their members, and conduct a thorough examination for the signs and symptoms of leprosy. **Results :** The total no. of cases (active/inactive) detected was 28 (0.53%). Out of 28 leprosy cases detected, Total no. of active leprosy cases detected were 14 (50%) and the total no. of inactive leprosy cases were 14 (50%). 7 cases not yet registered anywhere. Prevalence rate of leprosy among the actively involved commercial sex workers and their family members was 26.9. **Key words :** leprosy, commercial sex workers.

A Pilot Study on Cohort Analysis of Treatment Completion Rates in Uttar Pradesh, India

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Introduction : COHORT analysis of treatment completion rates is an important tool in monitoring the operational efficiency of service delivery which is rather infrequently used. A study of over 5000 cases was conducted in 19 of the 70 districts in September/October 2006. **Methodology :** A standard proforma to collect the information was designed and the District Technical Support Teams were trained in COHORT analysis involving the Government staffs who maintain the records at the health centers. The reference period for COHORTs (newly registered cases) is 2004-2005 for PB leprosy and 2003-2004 for MB leprosy.

Results :

PB cases : 2297 out of 2415, completed 6 doses in 9 months (95.1%)

MB cases : 3157 out of 3508, completed 12 doses in 18 months (89.9%).

In inter-district comparison the median was 96.5% for PB completion and 89.3% for MB completion. This study reveals a healthy treatment completion rates both for PB and MB leprosy in most of the districts.

Decadal Changes in MB : PB Ratio Among Leprosy Cases Registered at a Referral Hospital In Naini, Uttar Pradesh, India

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The advent of multidrug therapy has drastically reduced the prevalence of leprosy to less than one case per 10,000 populations globally except for a few countries. India achieved elimination in 2005. MDT should also reduce transmission rates and the ratio of MB to PB change as we progress towards eradication. A study was therefore undertaken at a referral hospital in Uttar Pradesh based on new cases registered during 1996 to 2005. Percentage of MB cases to total was calculated for each year, as well as by gender, age and place of residence. Although the numbers of MB and PB cases have declined, the ratios have not shown any significant declines. The implications of these findings are discussed. **Key words :** decadal changes, MB: PB ratio.

Trends in Skin Smear Positivity Among New Leprosy Patients Seen at a Referral Hospital in Naini, Uttar Pradesh, India

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Introduction : this study was conducted to determine any significant change in the percentage of positivity. **Methodology :** All new cases having bacteriological index positive 4+ and above, any site positive 4+ and above were chosen for the study. Percentage of positivity was observed. It was a lab oriented study, data collection from laboratory skin smear master register from the year January 1995 to December 2006. **Results :** The number of new cases each year was around 2800 initially, declining to about 2300 by the end of the decade. The proportion of positive bacterial index was 21% initially increasing to about 23%; percent with BI 4+ or more show a slight increase from about 6% to 10%. Among the positive BI, patients with 4+ or more was 31% increasing to 40%. The percent showing positive BI 4+ or more at any site increased from 3% to 6%. **Conclusion :** As multibacillary cases of leprosy decline, those with highly positive Bacterial Index seems to be on the rise, which needs urgent enquiry and appropriate action, if we need to progress towards eradication of leprosy. **Key words:** skin smear, trends.

Association of BCG Vaccination and Incidence of Leprosy

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It has been postulated that BCG vaccination administered during infancy has some protective effect on incidence of leprosy. A study was planned at our referral hospital to examine carefully for BCG scar among a random sample of leprosy patients along with an age-sex matched nonleprosy patients attending the hospital from similar geographic areas. 92 leprosy and 100 nonleprosy patients were studied. 44.3% had a BCG scar; 45.7% among leprosy patients and 43.0 among the nonleprosy patients, the difference not statistically significant. The differences were significant among males and younger age-groups, with higher percentage of BCG scar among nonleprosy patients. There was no difference in the manifestation of type of leprosy. Further studies on larger samples from different geographic areas will be necessary to test this interesting hypothesis. **Key words :** BCG in leprosy.

New Case Detection Trends of Leprosy Among The Inmates of Central Prison of Muzaffarpur - Bihar

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By view of existing living and working environment, prisoners are at a high risk of developing leprosy, which may manifest while they are in prison. Neglect of such persons would not only be debilitating the individual with progressive deformities, but also pose a problem of transmission of leprosy to other inmates. The Leprosy Mission Hospital, Muzaffarpur has taken care of leprosy patients identified in the Central Jail at Muzaffarpur during the past ten years with MDT as well as for treating various complications. Since 2000 till date, 119 active leprosy cases were treated, of which 46 were MB and 73 PB. Regular screening was done by medical and physiotherapists using standard techniques of body-charting, nerve function assessment and slit skin smear tests. Details of the patients and their problems are presented. It is concluded that regular screening camps should be organized in the jail and treatment provided to those in need. Thus, the high prevalence of leprosy in the Prison populations can be brought down and infections minimized.

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Introduction : *M.leprae* has lipid-rich walls and multibacillary patients do not have the ability to destroy bacilli, which multiply in Virchow's cells. It is possible that this fat may go into the blood stream. Therefore, the massive kībacilli killing by polychemotherapy may interfere with the patient's lipid profile. **Methods :** Forty-three patients with multibacillary and paucibacillary hanseniasis were assessed by measuring 12-h fast total cholesterol and cholesterol fractions before treatment and after the 6th and 12th dose. **Results :** Before treatment, increased total cholesterol and decreased HDL were observed. After the 6th treatment dose, PB patients showed increase in HDL and reduction in the remaining parameters, with significance for HDL and CT. After the 12th dose, MB exhibited enhanced HDL and decrease in the other parameters, with only LDL showing statistical difference. **Conclusion :** According to the results, hanseniasis patients are predisposed to cardiovascular disease before treatment. Specific treatment itself is a preventive measure against cardiovascular disease. **Key words :** hanseniasis, lipids, cardiovascular disease.

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Our purpose has been to highlight the dynamics of leprosy for the last 85 years. Majority of patients, namely 240 people (4.9%) were revealed in first two decades (1921-1940 years). The remaining 130 (35.1%) were revealed in the next six decades. After 1940 a tendency of decrease in the general number of patients were revealed in the republic. Endemics of leprosy is characterized by an important indicator which is morbidity of the disease. Thus in the period of 1921 – 1930, the intensive morbidity indicator was 15.05 per 100,000 population, in 1930-1940 – 10.36; in 1941-1945 – 13.77; in 1951-1960 – 3.05; in 1961-1970 – 1.06. For the next three decades this indicator was not defined as only a few cases were found that allows concluding about fading of leprosy in Armenia. Thus in Armenia one outbreak of leprosy was observed during 1920 on 1940 evidenced by revealing primary patients, new micro-foci, prevalence of lepromatous type of the disease, registration of children among patients and other indicators.

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Objective : To analyze the clinical characteristics and the misdiagnosis of the new leprosy patients from 1990 to 2004 in Wuhan. **Methods :** Data come from database of leprosy prevent the department of Wuhan Institute of Dermatology and Venereology. The history of new detected leprosy's clinical cases and registration material between 1990 and 2004 has been analyzed. **Results :** 80 new leprosy cases were detected between 1990 and 2004. 37 cases were detected between 1990 and 1994, and the detection rate was 0.047/100000, the sickness rate was 0.0042/1000, 19 cases were detected between 1995 and 1999, and the detection rate is 0.047/100000, the sickness rate was 0.0042/1000. There were 24 cases detected between 2000 and 2004. The detection rate was 0.052/100000 and the sickness rate was 0.0036/1000. The detection rate of the leprosy was fluctuated between 0.047/100000 and 0.052/100000 in the past 5 years. The detected leprosy type included LL type (24, 30%), BL type (18, 75%), BB type (9, 11.25%), BT type (12, 15%), TT type (20, 25%). The detected cases of MB type were more than PB type (48 versus 32). There were 53 (66.25%) misdiagnosed cases in 80 new detected leprosy patients. There were 2 cases misdiagnosed in our institute and 51 cases were misdiagnosed in general hospital (including the branch hospital). Among them 23 cases were accepted and treated by department of dermatology, and 8 cases were hospitalized repeatedly for more than 3 times. **Conclusion :** The detection rate and the sickness rate of leprosy in Wuhan city showed an obviously downward tendency since 1990. The detection rate and the sickness rate of leprosy reached the standard of "eliminating the leprosy basically" in 1994. But the misdiagnosis of leprosy can't be ignored. **Key words :** leprosy; new detected cases; misdiagnosis.

2000-2006 Year Hunan Province Chenzhou Leprosy Sends Case of Illness to Retard the Diagnosis Correlation Analysis Newly

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In order to understand my city leprosy newly sends case of illness to retard the diagnosis situation at present, retards the diagnosis the age sex distribution as well as the detention diagnoses and discovers the way, the source of infection, a! The level is unbalanced the remnant correlational dependence, has carried on the analysis to 2000-2006 year recent discovery 39 example leprosy case of illness, discovered the delay is longer, causes the male and female sex compared to the drop, the dermatology department to discover the constitution compares outside the rise, the family the infection constitution compares the rise. The level is unbalanced remnant rate also rises. **Key word** : sends case of illness newly; Detention diagnosis; Correlational dependence.

Epidemiological Investigation of the New Leprosy Patients in Sichuan Province from 2002 to 2006

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Sichuan is one of the provinces in our country where there are high prevalence of leprosy. Patients are distributed in the area where there were hard natural situation, low level of economy and sanitation. Since 1984, WHO started a pilot of multidrug therapy. In 1988, multidrug therapy were put in practice all over the province under the help of NSL. In 2003, Sichuan was took as the pilot province of Sino-Netherlands leprosy control item. In order to know about the epidemiological situation, provide the basic data for the item, we give the epidemiological investigation of the new patients from 2002-2006. We analyze the average incidence rate, area and crowd distribution (sex, age, nationality, occupation), source of infection, discovery approach, diagnosing spot, skin lesion, nerve damage, stage, classification and disability, time distribution etc. All of these are the basis of determining the emphasis of the leprosy control. Good leprosy control, decrease of disability more than stage two can improve the cure rate, reduce the psychological and economic burden of patients, improve their life quality, at the same time can decrease investment for leprosy control of the state, reduce the disease burden of the state and build a developing-continuable leprosy control system accord with cost-benefit ratio. **Keywords** : Leprosy Epidemiology Investigation.

Study on the Relationship Between Clustering of Leprosy in Family and Kin of Low Leprosy Prevalence Region

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Objective : To determine the high risk group and carry out monitoring through discuss the correlation between clustering of leprosy in family and kin. **Method** : The incidence rate had been surveyed in the Family which have leprosy patients had been found from 1949 to 2005 and analyzed the relationship between clustering of leprosy in family and kin. **Results** : 4839 leprosy patients had been surveyed, 2679(2679/4839=55.36%) whose family had other leprosy patients. Among 2679, 1486 had kin relationship with other leprosy patients in family, which account for 55.47%(1486/2679). Among 1486, having direct and indirect kin relation were 1143(76.92%) and 343(23.08%) respectively. The incidence rate of having kin relationship group was higher than that of no having kin relationship group ($P<0.001$) and more close kin relationship had higher incidence rate ($P<0.001$). **Conclusions** : The clustering of leprosy in family has high degree relationship with kin. The relative of leprosy patients especially in the children of patients were considered as the high risk group and the monitoring were carried out among them which has great effect to leprosy prevention. **Key words** : leprosy; clustering of disease in family; kin.

Current Analysis on the Epidemiology After Leprosy Basically Eradication in Guangzhou

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Objective : To analysis the current epidemic of leprosy after basically leprosy elimination achievement and acception in Guangzhou in 1998, and guide our work in the future. **Methods :** Data of current leprosy patient diagnosed since 1998 have been reviewed. From 1998 to 2006, Finding rate and disability rate MB/PB type ratio average delay period was compared every year from 1998 to 2006 between resident patient and floating population patient. **Results :** Of 131 patients, 35 were residents and 96 were migrants, the finding rates remained at State leprosy basically eradication level (1/100 thousands that 10 times lower than that set by WHO). The disability rate per year has no significance. ($P=0.690>0.05$). Average age of migrants at which leprosy was diagnosed decreased and much lower than that of resident. (t -test, $P=0.0024<0.05$). the same as the number of early case ($t=7.147, P<0.05$). **Conclusion :** Leprosy have been keeping at level of elimination bascially. But migrant leprosy steps up. Accordingly, we need to take some measures and focus on migrant leprosy when we continue our work for resident leprosy patient. **Key words :** Leprosy Epidemiology, Elimination.

Association Between Exposure to Particulate Matter (PM 2.5) and Leprosy Prevalence

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Objectives : To analyze the association between exposure to particulate matter (PM_{2.5}) and leprosy prevalence and detection rates in micro-areas of the Brazilian Amazon. **Methods :** Ecological study of estimated PM_{2.5} and leprosy prevalence and detection rates. The estimates for PM_{2.5} were constructed according to the amount of exposure (in hours) of each area, per defined cutoff point as violation in PM_{2.5} limit in 50 μg (in aerodynamic diameter). The estimates for the level of pollutants were calculated according to comparing the CATT-BRAMS Model to CPTEC/INPE for 2004 and 2005 along with the leprosy prevalence and detection rate for 2006, per geographic micro-areas in the Brazilian Amazon. **Results :** A positive correlation was verified from 47% to 51 % between exposition variable and leprosy prevalence and detection rates. A statistically significant result occurred from comparing means (ANOVA) using quartiles from the exposure indicator. The areas presenting the greatest number of critical hours for PM_{2.5} in 2004 and 2005 also presented a leprosy detection and prevalence rate 2.5 times higher in 2006. **Conclusion :** The increase in the level of exposure to PM_{2.5} is associated with the increase in leprosy prevalence and detection in the geographic micro-areas studied. Standard-of-living factors in the populations from these areas should explain the ecological association. Air pollution is only an indirect measurement of the ecological changes occurring in the Brazilian Amazon. **Keywords :** PM_{2.5}, leprosy, air pollution, Amazon. Ignotti, Andrade, Valente, Hacon, Longo.

Treatment of Leprosy in Rio De Janeiro State

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Introduction : Rio de Janeiro State adopted in the last forty years, three different regimes of treatment for control of the leprosy. That study analyze the evolution of these politics of treatment and theirs repercussions in the patient's quality of life. **Material and Methods :** It was analyzed registers of multi bacillary cases diagnosed in the period from 1980 to 2006. Informations were collected from both historic documents and information system. The variable defined to measure the quality of life was the physical incapacities in the multibacillary patients diagnosis at the same period. **Results :** From 1980 to 1989 coexisted a lot of regimes of treatment: since the longest one until the most innovative which is the MDT that appears in the end eighties. The length of treatment in the multibacillary leprosy cases was reduced of seven years in the period from 1980 to 1989 to seventeen months in the period from 2000 to 2006, when should last only twelve months. In all studied period, the percentage of physical incapacity found in the diagnosis was for over ten per cent. **Conclusion :** The delay to accept and introduce the MDT regime in the entire basic net, contributed in the persistence of the late diagnosis and in the installation of the physical incapacities in the last twenty seven years. **Key words :** leprosy, MDT, physical incapacities, Vale, Andrade, Andrade, Bitencourt, Moreira.

Free-Living Pathogenic Amoebae as Potential Reservoirs / Vectors in Leprosy Transmission

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Leprosy transmission remains poorly understood, though, prolonged skin contact and infection via nasal mucosa, are considered probable. Problematic in any hypothesis is the fastidious nature of *M. leprae* outside its host cell and a requirement for temporary survival in soil and/or water. In this study we show that *Acanthamoeba castellanii* a free living soil amoeba can ingest and concentrate *M. leprae* and the bacilli remain viable. More than 90% of cultured amoeba ingested *M. leprae* at 20:1 multiplicity of infection and infected amoebae thrived and multiplied normally. The ingested *M. leprae* remained viable for at least 72 hrs as determined by their metabolic activity (radiorespirometry) and cell wall integrity (viability staining). *M. leprae* from infected amoebae multiplied at the same rate as freshly harvested bacilli in the foot pads of *nu/nu* mice. Studies are underway to determine whether *M. leprae*-infected *A. castellanii* and other pathogenic amoebae may play a role in transporting leprosy bacilli through broken skin or the nasal mucosa. **Key Words** : *M. leprae*, *A. castellanii*, Transmission.

Factors Associated to Seropositivity of ML Flow Test on Leprosy Patients and Household Contacts Under 18

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Data on 115 newly diagnosed leprosy patients and 1,011 household contacts, under 18, were analyzed to determine seropositivity and factors associated to a positive ML Flow. The test was positive in 21.7% of patients and in 19.7% of contacts. Among patients, logistic regression indicated association of seropositivity with positive skin smear (OR = 18) and more than five skin lesions (OR = 5.86). Classification tree indicated association with skin smear, Madrid classification, number of nerves involved and age. In the contact group, index patient classification, age and type of health service were associated to seropositivity in both analyses. Contacts of multibacillary index patients had a chance of seropositivity two times higher (OR = 2.31). For each additional year of age, the chance of seropositivity for contacts was 1.06 times higher (OR = 1.06). The variables which best explained seropositivity were those associated to higher bacillary load. Therefore, the ML Flow test could also be used in children to aid correct classification of patients for treatment and to identify contacts with increased risk of developing leprosy. **Key Words** : Leprosy, Serologic Tests, Leprosy/Transmission.

An Analytical Report on MB Cases in Terms of Child, Disability

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Introduction : Wherever possible programs are recommended to analyse the main indicator of NLEP to monitor and review the program. In this context the analysis made of MB case in the nine districts, (DTST) covered by LEPRA Society. **Objective** : To study the trend of child, child disability and disability in MB cases. **Method and materials used for the analysis** : 1. Reports and records of PHCs in 9 districts. 2. Discussion with DLOs/MOs. 3. Reports & records of SLO/DLO offices. **Conclusion** : Over all more than good achievements seen after analysis. Findings and detail study will be presented.

Leprosy Occurrence by Age in Brazilian Indigenous Population

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Introduction : In the last 5 years the occurrence of leprosy in indigenous people who lives in special communities has been registered and elimination and control activities have been gradually implemented. This study analyzes occurrence of leprosy by age in indigenous population. **Methods:** Analyze of leprosy data registered from 2003 to 2006 by Special Indigenous Health District (DSEI) using as data source the Indigenous Health Information System – SIASI, maintained by the National Health Foundation. **Results:** The register leprosy cases (2004/2005) in people less than 01 year old means probably wrong diagnose. The others age groups from 30 to 39; 40 to 49 and 60 and more presented higher number of cases. In 2006 were diagnosed most of the cases of the period as result of trainings carried out to indigenous health professionals. The register of 224 cases in a population of 485,000 individuals in 4 years means that it is necessary to strength the surveillance and assistance activities on leprosy.

Leprosy Occurrence by Gender in Brazilian Indigenous Population

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Introduction : In the last 5 years the occurrence of leprosy in indigenous people who lives in special communities has been registered and elimination and control activities have been gradually implemented. This study analyzes occurrence of leprosy by gender in indigenous population. **Methods:** Analyze of leprosy data registered from 2003 to 2006 by Special Indigenous Health District (DSEI) using as data source the Indigenous Health Information System – SIASI, maintained by the National Health Foundation. **Results:** Data from the indigenous information system shows that most of the registered leprosy cases (72% - data under review) occurred in male. This is probably explained by the higher level of contact and exposition of the indigenous male in the urban centers. Although, the access of the female to the health services must be improved in order certified this trend, once in the general population the proportion of males and females with leprosy is basically the same.

Social Participation in People Reached by Leprosy in the Municipality of Sobral, Ceara, Brazil

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Participation restrictions are problems experienced in any life situation or context. The application of a scale to measure social participation is necessary for use in rehabilitation, stigma reduction and social integration programmes. The objective of this study was to evaluate the social participation of people reached for hansen's disease (HD) after MDT in a Municipality of the Northeast Region from Brasil - Sobral, Ceará. We use the Participation Scale (v 4.6) to quantify the restrictions in people reached by HD, based on the participation domains of the International Classification of Functioning, Disability and Health. This scale is a new 18-item interview-based instrument. Sixty-nine subjects, 10% of the total number of cases from 2003 to 2005 in this municipality, were evaluated. As a result of the final classification: 64 (92.8%) had no participation restriction, 4 (5.8%) had mild restriction and 1 (1.4%) had severe restriction. The case with great restriction was directed for psychological attendance. The scale allows collection of participation data and impact assessment of interventions to improve social participation. We consider the participation scale easy to be applied in the health services and can be used as useful tool for the integral attention of the people reached for HD. **Keywords :** Hansen's Disease; Participation Scale; Stigma; Disability.

Poster Presentations Leprosy Control and Elimination

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The Exhaustion in the Detection of Leprosy Cases in Brazil

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Objective : To analyze the expanding strength of the magnitude of leprosy in Brazil, according to the speed in the increase of detection and of the decentralization and deconcentration process during the period from 1987 to 2007. **Material and Methods:** Ecological study of the trend of the number of leprosy cases diagnosed in the period from 1987 to 2006, analyzing the number of cases detected and the number of health units and municipalities reporting at least one case of this disease and utilizing data from the National System on Diseases of Compulsory Notification and from state leprosy programs. **Results :** The reduction in the strength of the increase in new cases diagnosed was verified, inversely to the number of primary care units and of municipalities diagnosing at least one case of this disease. Over the past 5 years, 4 times as many municipalities and almost 10 times as many primary care units made a leprosy diagnosis. **Conclusion :** Decentralization and deconcentration of care for leprosy patients characterized the increase in offering early-diagnosis service within the healthcare network. Maintaining coverage for leprosy patients should lead to an exhaustion in case detection at the subnational level.

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The Twenty First Century Surge

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To highlight the continuing reporting of new patients in advanced stages of leprosy after 2001, which was not seen after 1980s. All new patients were screened at the above hospital including skin smears, POD assessments and HPE wherever indicated. 3984 new patients were seen since 2001, the number of skin smear positive were 420, those with grade II deformities were 640 and the number was almost constant since then. There were patients with 1000 lesions, with lesions more than 50 cms, florid histoid lepromatous leprosy with nasal ulcers, parent child patients and young persons with deformities. The individual sufferings of patients have enormously increased, the patients have to go from pillar to post to get treatment. The importance of universal early diagnosis has to be emphasized to each health worker to avoid human sufferings.

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Importance of Temporary Hospitalization Ward in Supporting Referral System and Providing Training Opportunities for the PG/UG Medical and Nursing Students

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The THW at the Kurnool Medical College, Government General Hospital has 20 beds (12 male /8 female). A total of 60 patients (55 males and 5 females) were admitted during April 2006 to March 2007 out of which, 8 Patients were with Reversal reactions, 12 with ENL reactions, Drug allergic reactions 3, and 37 were with complicated ulcers. Long time or permanent stay of leprosy affected persons is strictly avoided. Patients with complications attend through referral or by voluntary reporting. The THW operated as Referral Centre supporting the referral system for NLEP /District Nucleus. Specialized care is provided through collaboration with Medical, Surgical and other related departments. Training programme (Dermatology PG students, undergraduate Medical students and Nursing students) is a regular activity; patient models are available for learning following Objective Structured Clinical Examinations and Problem Based Learning techniques. The importance of the THW are analysed and discussed. The limitations and prospects of THW as a referral centre in the present scenario to provide quality leprosy services are discussed.

Integration of Leprosy , Lymphatic Filariasis and Onchocerciasis Control – Success Story in Republic of Yemen

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Leprosy, Lymphatic Filariasis and Onchocerciasis are disfiguring and deforming diseases. The first and second diseases are the most common causes of disabilities world wide and in their long history often associated with intensive stigma. Both diseases are in the bottom of the list of priorities. In Yemen The National Leprosy Elimination Programme(NLEP), was established in 1990 as vertically structured, had intensified its effort during the past 15 years to eliminate leprosy and other neglected endemic skin diseases as Onchocerciasis, locally known as Sowda and Lymphatic Filariasis, with its chronic manifestation Elephantiasis. The result is decreasing in the prevalence of leprosy from 2 cases per 10,000 population at the start of the programme to 0.19 by the end of 2006, decreasing grade 2 disabilities from 50% to 10%, identifying the focus area and vector of LF, decreasing in the prevalence of microfilarimiasis to 0% in low endemic focus area and to 0.6% in high endemic areas, and remarkable decrease in the clinical cases of onchocerciasis(sowda). The following article explain the experience of NLEP in controlling the 3 neglected skin diseases. **Key words** : Leprosy, Lymphatic Filariasis, Onchocerciasis, neglected, control, Yemen.

Three Decades of Leprosy Services - Hospital Study

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Introduction : Management of leprosy patients during and after active disease is unique in hospital setup. Sacred Heart Leprosy Centre, Sakkottai, South India, is a referral hospital functioning since 1916 catering to the needs of leprosy patients in the surrounding 12 districts and nearby states. A retrospective analysis was done to evaluate 30 years of work and to assess the trend. **Method** : Data was collected from hospital records since 1976. **Results** : Out Patient details: Year Total Attendance New Cases New cases daily average 1976-1980 27967 10947 (39%) 7 1981-1985 29876 6414 (21.4%) 4.25 1986-1990 21799 6408 (29.0%) 4.25 1991-1995 19953 6302 (33.2%) 4.25 1996-2000 23370 5160 (22.0%) 3.5 2001-2005 19154 3160 (16.4%) 2.25 Admission Details: Year Total Admission Ulcer Treatment Reaction Treatment 1976-1980 10800 7510 (69.50%) 1352 (12.5%) 1981-1985 12229 8335 (68.15%) 1195 (9.7%) 1986-1990 12154 7997 (65.7%) 953 (7.8%) 1991-1995 11821 8083 (68.3%) 260 (2.1%) 1996-2000 10923 8001 (73.2%) 181 (1.6%) 2001-2005 8060 6212 (77.07%) 57 (0.7%) Surgery, Physiotherapy, Eye and medical complaints were other admissions. **Discussions** : Being a referral hospital, OPD attendance remain the same. Though new cases number is declining, ulcer complaints tops the list of hospitalisation. **Conclusion** : Hospital treatment/care for ulcer and deformity is needed in the backdrop of cure and elimination. **Key words** : Leprosy, Hospitalisation, Ulcer treatment.

An or Model of Training Cum Service Through D.T.S.T.

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Introduction : The ILEP funded, 16 District Technical Support Teams (DTSTs) and one State Coordination Unit in Orissa supported the NLEP programme from May, 2004 to March, 2007. It has achieved its objectives and was appreciated at all fora. Along with regular activities, DTSTs have conducted 30 district and sub-district level POD camps in 2005 & 2006 though not a set objective. These camps were conducted for capacity building of the GHC staff, service delivery for the needy. This paper aims to present the outcome of these camps. **Methodology** : Each camp had the theoretical session for MOs & HWs on examination of patient and filling up of pre designed POD format. The practical session were conducted by dividing the trainees in to 4-5 groups. Each group examined 3-4 cases. At the end, each group has presented their findings of one interesting case and was discussed among the participants. Simultaneously all the patients were trained on the self-care practices and use of protective appliances. **Results** : Thirty such camps were conducted This Operational Model resulted in building the capacity of 1386 health providers in GHS and benefitted 1957 persons with disabilities. **Conclusions** : Training and service provision can be one of effective operational model in providing care in leprosy. **Key words** : DTST, POD or model.

Integration Status of NLEP During DTST & After DTST

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The vertical leprosy services have been integrated into General Health Care System (GIS) from 2000-2001. The District Technical Support Team (DTST) provided by International Federation of Anti Leprosy Association (ILEP) was providing technical support in all 38 districts of Bihar. Damien Foundation India Trust (DFIT) was providing support in 23 districts, LEPRO Society in 9 districts, Netherlands Leprosy Relief Association (NLRA) in 5 districts and The Leprosy Mission (TLM) in 1 district. An impact was made to assess the inputs of DTST in improving the leprosy services through GHS, for doing so in analysis of various aspects of leprosy program was done. All the hospitals and PHCs were providing the leprosy service as per NLEP guidelines. Medical Officers and Para-medical staffs have been trained in leprosy, MDT and various aspects of the program. Simplified Information System is in vague in all the health facilities. MDT drug procurement cycle is maintained and monthly meeting was done to monitor the program. The future challenge after DTST is regular supervision & monitoring of program by GHS and developing Core Trainer Group, reduction the delay detection & treatment, identification & management of complicated cases, RCS & POD, defaulter retrieval. The details information will be shared during presentation.

A. P. State's Status Report

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A.P. state's status report 1) State: Andhra Pradesh. It is surrounded by Tamilnadu, Karnataka, Maharastra, Chattisgarh and Orissa States. It consists of a population of 7.5 Crores. Major Communities living in the State are Hindus, Muslims and Christians. 2) No. of Colonies: It has 78 Leprosy Colonies in 23 Districts. 3) Population: The total Leprosy affected population living in the Community and in Colonies is about 55,000. The total population living in the colonies is 15,289 out of which Leprosy affected Persons are 9365. 4) Networking: Great number of colonies is found in Godavari districts. Until very recently, there was no useful networking system among the Leprosy affected people in A.P. 5) State Society: Society of Leprosy affected Persons in the State is constituted only in 2006 and it is now trying to develop networking among the different colonies. 6) Rehabilitation: As Leprosy is still facing stigma and discrimination, our persons are not provided with rehabilitation facilities, though they have knowledge about provisions to some extent. 7) Major Problems: Leprosy cured persons are included in the list of disabled persons by the Government. But Categories other than Leprosy affected Persons are considered mostly for Rehabilitation purpose in job placements in concessional reservation for travelling and Food provisions, Education Facilities, Vocational Training etc., 8) NGO's When the Leprosy Service was verticle and under special consideration, NGOs played an important role in treatment and welfare activities of the Leprosy Community in the State. The NGOs Contributed excellent service in this field are Lepira, GLRA, Swiss Emmaus TLM etc., But now, when the P.R is stated to have been brought down to less than 1 per 10,000, NGOs also lose adequate service due to restricted funds. 9) Major Requirements: 1) Increase of monthly pension to avoid begging. 2) Provision of food material at concessional price. 3) Provision of Rehabilitation. 4) Provision of free education to the Children.

Role of School Survey in Detecting Child Leprosy Cases

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Following the integration, a high MB rate among new leprosy patients is reported. However the child cases remained unchanged. Leprosy among children is a crucial indicator in the natural evolution and the epidemic profile of the disease. Realizing its importance, ALERT-INDIA undertook Selective Special Drives in schools under its Leprosy Elimination Action Programme (LEAP) during integration phase. During 1982 to 2006, an intense school survey of leprosy in N, S and T wards of Mumbai was carried out and 16,05,286 school children were examined. The case detection rate was 19.2 per 10,000. Although there has been steady decline in the NCDR since 2000, the range of NCDR was from 2 to 10.6 per 10,000 children. It was observed that the MB rate among child cases was much lower and age of the students showed no relation to the occurrence of leprosy. Leprosy was more common among the male students. The examination of the family contacts of these child cases has resulted in detection of scores of new adult leprosy cases. School survey for child cases, despite limitations, is a useful, cheap and rapid method for detection of leprosy cases in the community. Additionally awareness campaigns among school children are an effective means to reach the family and the community.

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From the migrated and emigration population the leprosy cases were missed and not taking MDT regularly. So the disabilities were developed and also infections raised operation problems of floating population and their strategies. Lack of health education of leprosy in floating population. Lack of routine health check up for the above population based upon the results suggested that it is necessary to strengthen the management of floating population established the regulations of routine health check up to mobilize the role of the Primary Health Care conduct health education and practice patients self reporting. Some communities have not been cooperating our routine check up for case finding Poor transportation and communication facilities Vacant post of public health care system since a long] Tribal and Hill areas and remote areas Irregular patients have not been taking MDT Due to illiteracy the villagers are not aware of the leprosy Solutions to be implemented are suggested : For migrated patients AMDT should be given We have taken cooperation with community leaders from those communities that were not cooperated with PHC staff for case detection For some village have not availability of transportation in that village. PHC staff had detected the case and given regular treatment in their routine programme Also taken every cooperation not only from patient's family members but also from the patient's family doctor Rehabilitatin should be arranged for discharged cases and disability cases.

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A significant number of patients still delay reporting till deformity occurs. Factors contributing to such delay are many and varied. Ignorance, as well as availability of expertise, stigma and fear of diagnosis poses obstacles to early reporting. In this paper, our experience at 2 urban leprosy hospitals at Delhi and at Kolkata is described and the strategies for reducing delays discussed. Relevant data including grade of disability and bacterial index are extracted from the hospital registers and patients' charts on 415 newly diagnosed leprosy cases at Delhi and 406 at Kolkata during 2003 and 2004. Overall, 20% of newly diagnosed leprosy patient presented with grade 2 disability, 15% at Delhi and 25% at Kolkata. In Kolkata, the disability grade 2 is more in the outside (35%) the state than within (24%). Nearly 20% of the newly diagnosed MB patients had bacterial index 2+ or more, 22% at Delhi and 17% at Kolkata. It is concluded that there is still a high proportion of patients, especially with multibacillary leprosy, who report late. That a majority of these patients are within the state itself calls a review of our awareness programmes and strengthening of our general health services. **Key words** : delayed presentation, delay in leprosy.

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The NLEP was a programme run vertically through leprosy only staff with strong support from NGOs. In the year 1996-97, ANCDR was 51.2/100,000 with PR at 5.75/10,000. During the decade (1998-2007) main programme changes were in duration of treatment, use of ROM, campaigns, decentralization, flexibility in approach, state society formation, integration of services, discontinuation of ROM, simplified information system, modified SET scheme for NGO and urban leprosy control programme. Partners supporting NLEP were WHO, ILEP, DANIDA, SMHF & TNF, NOVARTIS and local / international NGOs. Drastic changes in indicators like ANCDR, PR, Proportion of MB, CHILD and GR. II DISABLED among new cases seen in 2006-07 as compared to the year 1996-97. Other programme achievements were decreasing new case detection since 2002-03, improvement in cure rates availability of integrated services from all health centres, establishment of referral services, involvement of Govt. medical colleges/ PMR centres and increased awareness about leprosy resulting in reduction of stigma. Future expectations under the 11th. Plan period aims at further reduction in leprosy burden in the country and provision of high quality leprosy services and adequate Disability prevention and medical rehabilitation services. The decade 1998- 2007 proved to be the most successful period for the NLEP in India giving benefit to more than a billion people of the country.

Relevance of Referral Centre in an Integrated Leprosy Care Model

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Hyderabad Leprosy Project as an NGO delivered MDT in NLEP through drug delivery centers and a central clinic, which functioned as a referral centre. Following integration of leprosy services in the year 2002, cases were registered at urban health posts. Technical support was provided by Hyderabad Leprosy project at the implementation level. The referral centre catered for consultation in diagnosis of leprosy, treatment of reactions and care of deformities for cases mainly in the district and also from neighbouring area. Active leprosy cases were referred to urban health posts. At the centre cases with reaction were treated, deformity care with required physiotherapy and foot wear is provided. Following a sensitization of private practitioners' referrals for diagnosis, skin smears has increased. During the last 4 years, 791 patients reported for diagnosis of whom 195(25%) are from neighbouring districts. Among these 360 are MB cases of whom 66 (18%) were positive. Examination of 791 registered patients showed 30(3.8%) with Grade II disabilities and 28 with anaesthesia. The efforts of the referral centre to enhance access to services, clinical data of cases registered during years 2003 to 2006 are presented. Based on the data the relevance of referral centres in comprehensive treatment and care of persons affected by leprosy is discussed.

Trend of New Case Detection in Bihar

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The goal of leprosy elimination has been achieved in many districts & states. As the prevalence of leprosy reduced dramatically, the leprosy program integrated with General Healthcare System. The influence of operational factors on new case detection has been reduced significantly. New case detection has gained more important. The trend of new case of leprosy over a longer duration will provide insight to various epidemiological and operational factors affecting NCDR. Bihar has fully started with MDT in 1995-96 in all over the state. A trend analysis of data pertaining to Bihar was carried out for a period of over 12 years from 1996 to 2007 and various characteristics like PR, NCDR, MB%, child % were analyzed. There was dramatic decline of PR. Similarly there was steady declining in NCDR but since 2005 it was found more or less static. The child and MB proportion did not show much difference over year. The detail study will be shared during presentation.

Second Opinion in Leprosy a Strategy for the Leprosy Elimination and Control Program

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Leprosy diagnosis is based on case history (anesthesia) and clinical examination (skin discoloration). The studied of 106 cases sent of 8 Health Unity of different places of São Paulo, for history and clinical images to technologically advanced centers showed moderate concordance by Kappa method. The results suggest that this methodology can be an initiative to broaden opportunities for diagnosis and treatment and a strategy for the leprosy elimination and control program. **Key words** : second opinion, education distance, program leprosy.

Role of DTSTs in Improving Quality of Leprosy Services in General Health Care in Orissa

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Introduction : Leprosy services were integrated into general health care, in state of Orissa and the integration was supported by WHO and ILEP as partners in the NLEP. ILEP provided technical support teams as DTSTs comprising of a public health expert and a Non Medical officer with suitable mobility. The main task was to train all levels of health staff to improve diagnostic accuracy at PHC and documentation. **Methodology :** In the state of Orissa, 16 teams were formed in 2004. In two and half years of the project tenure, 2701 medical and 8990 para-medical staff were trained on diagnosing leprosy and prescribing MDT. In addition to training, cases detected by medical officers at PHCs were validated to facilitate good quality leprosy services. Besides re-examining cases detected by PHC medical officers, the process of registration was also assessed to improve the process. **Results :** During the project tenure, a total of 13,137 cases were re-examined by the DTSTs. The accuracy of diagnosis at PHCs improved from 50% before induction of DTSTs in the programme to 91% in the last quarter of the year 2006. Details of the technical support provided and improvement observed in the leprosy services at PHCs are presented in the paper. **Conclusions:** Validation exercise improved the skills in diagnosing leprosy. **Key words :** WHO, NLEP, ILEP, DTSTs.

LEPRA Projects Serves as a Model for Comprehensive Care in Leprosy

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Introduction : LEPRA Society initiated leprosy control activities in Orissa with one project in 1990 and extended to seven projects, in eight comparatively in-accessible districts, inhabited mostly with tribal population. The activities of the Society included quality MDT service and comprehensive care for the consequences of leprosy, starting from teaching self-care practices to RCS and rehabilitation has been an important activity of its projects. This paper examines the trend of residual problems and their management. **Methodology :** In addition to MDT services as per the WHO guidelines, POD/POWD were undertaken through training on self-care, supply of protective appliances, Physiotherapy and RCS. The entire activity schedule from assessment of NFI to regular supervision, SER have been designed and followed in all the projects. The exercise indicates the pattern and extent of services needed for different problems faced by leprosy affected persons. **Results :** Since inception till December, 2006 about 76,260 persons have been cured from the disease. Of them, 8,279 (10.8%) persons had disabilities with Gr.I-2,591 (31.3%) and Gr.II 5,688 (68.7%). All were taught about practicing self-care, use of assistive devices. Of the 5,688 persons with Gr. II disabilities, 1,717 (30.2%) have availed the facilities of RCS. 2,781 surgeries were conducted on these persons with an average of 1.6 surgeries per a person. Around 45,304 MCR footwears were distributed among the persons with foot disabilities to protect their vulnerable feet. Indoor care has also been extended to all the needy. About 8,017 persons (10.5%) have been rehabilitated under various welfare schemes. **Conclusion :** The consequence management followed in LEPRA projects more or less serves as a model for GHCS. **Key words :** Comprehensive care, Rehabilitation, Self-care, Disabilities.

States's Status Report – Outline – West Bengal

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State-general introduction : Location- In the Eastern part of India, Population-near about 9 crore, Communities- People of all communities stay in the State.(Hindu, Muslim, Christian, Jain, Buddhists, etc.) Number of Colonies: 35 Total Population – near about 9 crore, totals leprosy affect- 2.75 lakh Total leprosy –affected living in the colonies: 4127 among total 11946 colony peoples. Major distribution and Net working within Leprosy affected people: Through regular meetings in different set up of the organization and information through messengers, telephone, inter net and postal correspondence. Present government support for social rehabilitation : Very little. A number of colony people gets 12kg of rice only per month, Old Age pension-219 in seven Colonies, Housing- 322 by Panchayet and Municipality Major Problems in social rehabilitation : Stigma and economic insolvency . NGOs. **Working in the State :** GLRA, TLM, GMLF, HKNS,MKNS, RKM, BKKP, LAMP, MLRC , Missionaries of Charity, etc. Three major immediate requirements of the leprosy affected people in your State: 1) Treatment, dressing and shoes supply. 2) Socio-economic Rehabilitation. 3) Special attention with economic-package for improvement of education & cultural among colony children.

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As per directives of Central Leprosy Division (CLD), Govt. of India, states have to keep two months MDT drug stock at PHC, two months stock at district, and two months stock at state head quarter stores and have to indent from states to CLD every quarter i.e. in April for April- June, in July for July-September quarter and so on. As it is self explanatory from guidelines that for the month of April state have to indent in April and for July in the month of July. When states indents, it takes one full month or even more till MDT reached to the states i.e. not before May for April- June and in August for July- September quarter and so on. Resulting there is paucity of MDT drugs or even nil stock in state stores in April-May, and in July-August and thus a situation of chaos arises in the states, when indents are pouring in from districts and states have to told them that there is no MDT drugs in store, please come next month or states will inform them, when MDT will be available in states and a storm also came in states that why there is paucity of drugs or nil stock? At that time an awkward situation arises at state level and is very difficult to reply every body from top to periphery. To avoid this awkward situation authors reached to the conclusion that indenting month should be changed i.e. at least a quarter earlier - in January for April- June quarter and in April for July- September quarter and so on. So if states indent in January it will materialize latest by February and stock will be available for April to June quarter and similarly for other quarters also. Thus state will not face any paucity of MDT drugs and will be in position to supply to the periphery without any interruption and there will also not be any wastage of drugs.

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In the bharuch district National Leprosy Control Programme and then after national eradication programme run by Government of Gujarat health department by support of Govt. of India health department and world health org. Bharuch Dist. is High endemic Dist. in Gujarat State located in south Gujarat on costal belt so leprosy dieses highly positive and infection other then north Gujarat and sourastra Dist. In the year of 1989 M.D.T. Treatment start for the leprosy patient and get good result M.D.T. in bharuch Dist. At the time of started M.D.T. in bharuch Dist. Prevalence rate is more them 22 per 10,000 population and after 5yr M.D.T. programme new case detection rate below 5 (five) in Bharuch Dist. In bharuch Dist. Socials stigma present in two talukas Hansot block & ankleshware block case of deform patient leprosy patient Now today no socials stigma present in our bharuch dist. Any blocks due to less deformity ratio in new case dictation and RFT leprosy patient . Now last 5yrs in show in the graph of NLEP indicators as below

Sr.No	Indicators	March-04	March-05	Mar.06	Mar.-07	Apr. to Aug.07
1	NCD	1191	469	586	748	254
2	ANCDR	8.23	24.3	87.4	84.4	11.3
3	Pts. on Treatment	656	270	364	394	395
4	P.R.	4.59	1.82	2.42	2.59	2.56
5	RFT	1188	785	485	485	262
6	MB Ratio	27.88	(332)	36.24	(170)	40.78
7	(239)	38.37	(287)	40.55	(103)	7
8	Child Ratio	26.88	(320)	16.88	(81)	21.33
9	(125)	12.70	(95)	14.96	(38)	8
10	Deformity Ratio	0.91	(6)	2.13	(10)	1.37
11	(8)	1.80	(12)	0.39	(1)	9
12	Female Ratio	44.16	(526)	41.16	(193)	43.10
13	(278)	42.56	(352)	49.61	(126)	

Deformity ratio taluka wise as on aug-07 is only Ankleshware block 5 and seven block is nil deformity in new cases Ankleshware block has largerst industrial area and the migrated labour/people belong other state. So more deformity in new cases then other block but no social stigma in local population/labour for the bharuch dist. Health department man power is below for the total midyear population of bharuch district 15,14,932 No. of PHCs 37 and No.of village 657 total Multipurpose Health worker Male 165, and Female Health worker/ Auxiliary Nurse Mid-Wife 189 Male Health Supervisor 27 and female health supervisor 20 the vertical staff of leprosy are 27 pera medical worker leprosy and 8 leprosy superwiser so good setup and manpower of health services for the bharuch dist then other dist. Leprosy programme integrated in general health services started as on Apr-03 now IEC/IPC activities and treatment given to the patient of leprosy by general health staff deformity and comrehciv Leprosy care activities and monitoring leprosy programme activities by vertical staff under supervision of Chief District Health Officer and District Leprosy Health Officer so we do this they are surely we create world without Leprosy.

Selective Special Drive (SSD) - A strategic Intervention to Promote New Case Detection Through Community Partnership

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Integration of leprosy into the General Health Care System is the crucial policy change by the National Leprosy Eradication Programme (NLEP) in India. This policy change has adversely affected the early new case detection. Presently, the new case detection is totally dependent on the voluntary reporting. This calls for an effective strategy to reach the community to promote and sustain voluntary reporting of new leprosy cases. Selective Special Drives (SSDs) initiated by ALERT-INDIA under its Leprosy Elimination Action Programme (LEAP) is a community partnership strategy to promote and sustain new case detection by involving the community – specifically, local volunteers, teachers, students, health workers of CBOs / NGOs, traditional healers, anganwadi and ASHA workers etc. SSD equips and enables them to act as leprosy spokesperson in their community and refer leprosy suspects during integration phase. Under the LEAP Partnership programme, 12 NGOs from health, developmental and educational sectors had implemented SSDs in 6 rural districts of Vidarbha region of Maharashtra and in 1 district of Chhattisgarh states. More than 707,000 tribal and rural population living in 707 villages from 18 blocks of 7 districts were reached through SSD with emphasis on focussed IEC by the trained community based volunteers / groups. The paper will discuss the operational methodology of SSD intervention that resulted in sustaining leprosy awareness and improving the new case detection.

Leprosy Detection Rates by Health District in Brazilian Indigenous Population

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Introduction : In the last 5 years the occurrence of leprosy in indigenous people who lives in special communities has been registered and elimination and control activities has been gradually implemented. This study analyzes the trends and behavior of leprosy detection rates between indigenous people. **Methods:** Analyze of leprosy data registered from 2003 to 2006 by Special Indigenous Health District (DSEI) using as data source the Indigenous Health Information System – SIASI which is maintained by the National Health Foundation, a foundation of Ministry of Health which is responsible by the health care of this population. **Results:** Twelve of thirty four DSEI registered leprosy cases in indigenous people. These districts are in the areas of higher detection rates in the general population. In 2003 06 DSEI informed cases and in 2006 08 informed as result of trainings carried out to indigenous health professionals. In the period the detection rates observed were from less than 1/10,000 until 18/10,000 inhabitants.

Leprosy Occurrence by Operational Classification in Brazilian Indigenous Population

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Introduction: In the last 5 years the occurrence of leprosy in indigenous people who lives in special communities has been registered and elimination and control activities have been gradually implemented. This study analyzes occurrence of leprosy by operational classification in indigenous population. **Methods :** Analyze of leprosy data registered from 2003 to 2006 by Special Indigenous Health District (DSEI) using as data source the Indigenous Health Information System – SIASI, maintained by the National Health Foundation. **Results :** Most of the register leprosy cases 68,9% (data in revision) in the period were multibacillary, but an important part (9,6%) does not have operational classification. The register this percent of MB cases means that it is necessary to strength the surveillance and assistance activities on leprosy in order to improve early diagnose.

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Why urban leprosy control ? 44% of the Tamilnadu population is Urban Rural health system has a good Structure, Strategy and resources(Uniform, well structured Primary Health Care delivery system) PHC – Subcenter – VHN for every 5000 population for each and any contingency is an excellent arrangement (may not be perfect in some places but the potential for Ideal exists) Urban Health Care is lacking in Uniform, well structured Health Care delivery system Existing Urban Health Care is complex and pluralistic Hence partnership between existing service providers (both Govt. and NGOs) and stakeholders necessary Political commitment, Partner support and Community involvement are indispensable PROJECT OBJECTIVE -ULEP To establish sustainable MDT services in identified Urban areas resulting in mainstreaming of leprosy cases in to general health care services. Highlights 29 Urban Facilitation Teams appointed by ILEP Agencies in Tamil Nadu. The whole programme of operationalising is done without expenditure from Government (Eg) District capacity building and IEC was done jointly by Govt.& ILEP agencies with local resources. Ownership for Urban Leprosy Programme have been successfully taken up by local administration and General Health staff. ULEP is operationalised in 29 districts of Tamilnadu having approximately 1210 Health centres/posts with a population of 2.72(out of total 6.4) crores. 90% of Medical Officers and Health staff have been oriented in Urban strategy. Advocacy and follow up action are given top priority at this stage. Special groups like Self Help Groups, Service Clubs, NSS, Scouts, Volunteers & Students ICDs are fully utilized in this unique community based project. At State level GO/ NGO have amalgamated excellently in planning and operationalising the Urban Leprosy programme. At District level Local Elected Representatives, Community leaders, Commissioners are involved to strength the ULEP.

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Introduction : Leprosy Services in Tamil Nadu had integrated with public Health Services form 1.8.97. In Chennai city, the vertical setup is being continued under the control of Deputy Director of Medical Services (Leprosy). Working in urban Leprosy elimination program is a unique experience. As a part of anti leprosy day Celebrations, we have conducted awareness raising Programmes at 40 selected important IOCL (Petrol Bunk) outlets in the heart of Chennai city with the cooperation and active support of Indian Oil Corporation Ltd, Chennai Region (to fulfill their social obligations – corporate social responsibility). Nearly 400 city college students (Both gender) from different colleges actively participated in this programme. **Objectives of the Study :** To assess the level of awareness about Leprosy disease relating to curation, availability of Medical facilities at free of cost, among various sections of people. **Methodology :** The researchers have selected the ex-post facto (descriptive) research design. Primary data were collected in the questionnaires that were administrated to the customers, visitors, Passengers, Drivers and others from two, three, four wheelers who have visited the outlets. College students, who had undergone sensitized training programmes, collected the data under the supervision of NLEP staff. **Total Number of Respondents :**

Two Wheelers	Three Wheelers	Four Wheelers	Total
2076	1242	822	4140

The collected data were subjected to statistical analysis (Simple average and Percentage) **Results :** 1. More than 95% of the respondents believed that Leprosy is a completely curable disease. 2. Nearly 82% of the respondents knew that free medicine is available for Leprosy in Government Medical Institutions. 3. Significant difference was found between four wheelers travelers and two wheelers riders on knowledge about Leprosy. Detailed reports in facts, figures, and diagrams will be presented in the original Presentation paper. **Key words :** Elimination, Integration and Awareness.

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Importance of the Applicatory Hanswin in the Update and to Observe the Evolution of the Abandonment of Cases of Leprosy in the State of Paraná-Brazil

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Introduction : the present work looks for to demonstrate the importance that instrument "Applicatory Hanswin", propitiated in the update and analysis of the situation of abandonment of the cases of leprosy in the state of the Paraná - Brazil. After its implantation also allowed, beyond analysis epidemiologist and operational, to better elaborate the profile of the endemic disease in the hierarchic levels for taking of decisions in differentiated and quiet areas of risk, elaboration of you inform of the situation of the evolution of the elimination of leprosy in the state. **Methodology :** Historical Retrospect, Implantation of the Applicatory Hanswin in the 399 cities of the State, in 2004, Applicatory disponibiliza emission of at least 18 nominal reports, according to category of the attendance cities, with possibilities of magnifying. **Results :** It made possible the identification of the real situation of the abandonment of the cases of hanseníase of the state and its reduction of 51,5% in 2003 for 8,3% in 2006, comment of the evolution of the cases in opportune time of high; better using the time for activities of hanseníase with attention to the contacts. **Conclusions :** Application of some pointers facilitated, It facilitated to the programming and planning of action of control of leprosy, It improved the evaluation and taking of relative decisions to the allocation and distribution of financial resources, Evaluation of the impact of the carried through interventions made possible better, Identification of the areas of risk and in phase of consolidation of the elimination of the endemic disease, More necessary elaboration of studies on the evolution of the illness in the state, Update of the data base. **Words Key :** abandonment, applicatory, support, analysis, decision.

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Comparison of New Case Detection in CLTRI RFOA and Kancheepuram District in Tamil Nadu

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The introduction of MDT and successful implementation of MDT has resulted a dramatic decline in prevalence of leprosy. The new cases detection has also reduced significantly in endemic areas. Though the indicators on PR and NCDR remains same in a pocket of area and larger area, other indicators on clinical profile of leprosy are varying. Thus a comparison analysis of CLTRI Rural Field Operation Area and Kancheepuram district is carried out to study the differences for the period 1986 to 2007. Both of the areas are endemic in leprosy and CLTRI RFOA is located in the Kancheepuram district itself. Both areas achieved the elimination of leprosy in 2005. There is a significant difference in MB and Female case detection. The trend of deformity cases among new case shows relative population size is important for drawing inference. This analysis throws light on formulating different strategies on new case detection.

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Knowledge of Leprosy Among Basic General Health Service (BGHS) Staff at Periphery Level After Leprosy Training

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Nepal Government adapted to integrate Leprosy control programme into general health service in 1987. Then government asked Anandaban leprosy hospital to undertake responsibility to train "Basic General Health Service" staff from 19 districts of Central Development Region (CDR) of Nepal in 1993. The aim of the course was make them capable to diagnose, classify and treat the people with leprosy. It included contents to recognize if the patient had complications & manage it at basic health facilities. There are about 1300 government health facilities in CDR which provide service to population of 7850000. In period of 13 years, from 1994 to 2006, about 2500 individuals received training in leprosy. Report showed that BGHS in peripheral health facilities have diagnosed only 36% of total new cases of leprosy. In this study we have assessed reason behind low-number of case detection by trained BGHS staff. Could it be due to low level of knowledge imparted to them, poor attitude of individual and burden of work is beyond their capacity. This study had focused in 3 endemic districts Chitawan, Bara and Parsa of Terai (Bordering to India). 75 BGHS staff were interviewed at their place, that was 25 individual from each district.

Disability and Deformity Trends Due to Leprosy in the Elimination Era. A Retrospective, Descriptive, Analysis of Newly Registered Persons Affected by Leprosy, in an Outpatient Setting in Uttar Pradesh, North India

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Introduction : In spite of 25 years of MDT implementation and coverage as the most effective anti-leprosy treatment on a nationwide scale, disabilities and deformities continue from the past into the future. The post MDT residual [disability and deformity] content added with the incident D&D pose a greater challenge than expected. With drastically reduced leprosy care facilities more patients may have to put up with their D&D. **Summary :** Visible leprosy remains as the core of the problem through the ages and now as well. Treatments, programmes, projects, drive both public and private, voluntary and from NGOs come and go. Every self-reporting/referred case would be screened for sensory and voluntary muscle assessment. Disability and deformities are graded according to protocol. Careful individual and registers are kept and maintained. Necessary informed gleaned from existing patient records, registers and other records. Data compiled and analyzed for PB and MB for trends and presented. **Conclusion :** This study shows and reinforces that it is absolutely safe to give MDT during pregnancy. Counselor's and Nurses' supportive role plays a significant role in removing fears, anxieties and worries for pregnant women patients. **Key words:** disability and deformity in leprosy, trends of deformity in leprosy, deformity in leprosy.

Knowledge of Leprosy Among Medical Officers of Vizianagaram District, Andhra Pradesh, India

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Vizianagaram District of Andhra Pradesh is an endemic area for leprosy and one of the districts which pioneered MDT in the 1980s. The Philadelphia Leprosy Hospital, Salur had conducted many training programmes in Leprosy for Medical Officers earlier. Recently District Technical Support Teams (DTST) have worked in the district to build the capacity of Medical and Para medical staff. While the Primary Health Centres / Community Health Centres and District Hospitals in the district are working for leprosy control, in the absence of the support from DTST, it is felt essential to assess the knowledge level of the medical staff in leprosy. Knowledge of leprosy of all the available Medical Officers (70) working in the Primary Health Centres / Community Health Centres and District Hospitals was ascertained by administering a standardized questionnaires. Results show that correct knowledge is found regarding duration of incubation period among 81 %, effects of MDT among about 79%, spreading of leprosy 100%. About 68% has knowledge about reactions in leprosy and 86% showed understanding about prevalence rate etc. **Key words :** knowledge of leprosy, in medical officers

Micro-Economics Surrounding MDT, A Calculation of Cost to the Self-Reporting Patient at an Outpatient Facility in Uttar Pradesh

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Introduction: MDT covered most patients through statewide [and nation-wide] field implementation, reached elimination target. But yet many patients active and never treated before, still self-report to the OPD facility. They hail from the same district as well as from 7 districts afar from northwest Uttar Pradesh. Their health seeking behavior/drive incurs significant cost to the patient. A calculation of cost by distance is analyzed and presented. **Summary :** For many persons affected by HD, treatment does not come easy. In the elimination era it is much more difficult to find a proper place of treatment. The search for a reliable treatment centre not only takes time, but also has a bearing on his disease course. The pressures of his/her household, community, friends and advisors mount. The self-reporter does not report alone, but with at least one person who would accompany him on his/her maiden journey to the point of treatment. **Conclusion :** The study concludes that it costs significantly to the patient's household to go and get treatment especially from a referral centre. Patient's financial position has a direct bearing on his treatment (MDT/Complication) compliance. **Key words :** micro economics, leprosy

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Role of Non -Economic Factors In Economic Empowerment of Leprosy Affected People

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Problem Statement : Providing financial assistance to the leprosy affected and their families has been a common means of economic empowerment. However, it is observed that many of the beneficiaries could not achieve any improvement economically and the underlying reasons are not known. **Objective :** To find underlying reasons for the inability of leprosy affected to develop their life economically even after receiving financial assistance. **Method :** A set of questions is been framed and the questionnaire survey has been conducted among all the SER beneficiaries through our mission. **Results :** The response from the finding shows that 60% of people report that they are not uplifted in their life through the loan. In addition, those who feel that the assistance uplifts them said they are only 25 % improved as compared to their previous stage. The people who fail in income generation through SER Loan state that they need some training for the purpose of the loan given. And some report that the effective way should only through the providing of Job instead of loan. Most of them feel the best repayment amount per month of the loan should be as standard as that of Rs. 200 per month. They need more ideas from the CBR supervisor and motivation for proper usage of the money and income generation even with their physical disability and social stigma. **Key words :** economic empowerment in leprosy, non economic factors in leprosy, empowerment in leprosy.

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The Fight Against Leprosy Need To Go On

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During nineteen eighties the governmental and the non governmental organisations worked harmoniously for the care of leprosy patients. The rate at which the prevalence declined made some experts believe that the eradication of the disease could be an achievable target. In Tamilnadu, there was also a significant reduction in the new case detection rate. Unfortunately, this success story has a sad ending. In the old project area of Christian Medical College, Vellore, new cases continue to emerge though at a much lower rate. Majority of them are MB (56.25%) and BI positivity is 25%. We have referred 16 cases to PHC and none of them were registered or treated by them. 21 year old Somsundaram who had recently completed a course in polytechnic presented with extensive infiltration and was found to have 5+ BI. There was no family history of leprosy. It is obvious that he has been transmitting mycobacterium leprae to others for the past several years. Primary health centres in this region do not carry out skin smears. There is a need to review the reluctance on the part of Primary Health Care system to register cases. Leprosy continues to cause significant social consequences. Better relationship between the governmental and non-governmental agencies need to be nurtured so that our fight against leprosy reaches its logical conclusion.

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Integration of Leprosy Services into GHC Services - Delhi Experience

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In the state of Delhi the leprosy services were integrated with GHC services since 2001. Earlier the services of leprosy diagnosis and treatment were available through 10 leprosy clinics. Following integration there was steep increase in the number of health care facilities providing leprosy services. The process of integration has helped improve leprosy care facilities. Although there was some resistance by GHC staff, the overall results have been encouraging. Despite these advances in integration there are few operational issues that need attention such as lack of guidelines to calculate indicators in urban setting. We have noted that awareness level among patients and their relatives is limited to clinical signs & symptoms and diagnostic services however there is lack of awareness on other leprosy related services at health care facilities and rehabilitation services. We propose that there be a policy to retain trained personnel in a particular location for a period of 2-5 years and better coordination among different government agencies. We envisage the future challenges as access and affordability to quality leprosy services to the poor. The sustainability of leprosy services under integrated setup needs strengthening. **Key words :** integration of services, integration in leprosy programs.

Factors Influencing the Development and Strength of Community Participation in East Godavari District

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Community participation is of key importance to the sustainability and effectiveness of community projects. The specific factors influencing the development and strength of community participation in East Godavari district, Andhra Pradesh were clearly assessed. It is a retrospective non experimental study about Community participation for a successful mega camp in East Godavari district in November 2005. The goal of this program was to enable the district disabled to get free artificial limbs, assistive devices & free Corrective surgeries for general deformities. Since it is a large district having 60 blocks and 4900000 populations, it was decided to concentrate only twelve blocks surrounding the TLM Hospital, Ramachandrapuram. Camp was successfully organized for two days (23-11-05 and 24-11-05) with the full cooperation from the community as well as from the like minded stake holders. Reviewing the involved stake holders after the camp provided an opportunity to assess the nature of participation rendered and factors which promoted it. Social relationships and the popularity of the TLM hospital influenced community networks, and helped to determine the direction, Success and Sustainability. Prior involvement of the stake holders in social work and perceived effectiveness of the senior staff in implementing plans were important factors. Eventually sustainability was also improved by the fact that TLM Hospital was very familiar with the community's locale and enjoyed pre-existing reputation within the community more than 100 years. Similar methodology can also be used in other TLM Hospitals where they have community projects.

Early Diagnosis and Management of Leprosy in Non-Prevalent Region of China

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It is common that leprosy was misdiagnosis and missed diagnosis in clinic, especially in non-prevalent region of China, such as Shanghai. Most of the new patients with leprosy were fluid population and 85% patients came from the prevalent region in Shanghai. The patients with leprosy from the prevalent region in Shanghai were much more than that of others provinces in China, which average level was 2.1%. The managements should be different because the constitutions of the patients were much different in prevalent and non-prevalent regions. Some management of leprosy was not suit to treat the patients in non-prevalent regions. Normally, most of the patients with leprosy saw a dermatologist firstly in clinic because of the lesions on their skin. However, it was common that dermatologist misdiagnosed and missed diagnosed of leprosy. Many factors contributed to it. The vigilance, the skill of diagnosis and check-up of the dermatologists were the most important factors. We suggest that the education on leprosy for dermatologists should be pays more attention in non-prevalent region. The functional community in Shanghai was very important for the prevention and cure of leprosy. In the future, the prevention and management of leprosy should be brought into the public health care in community.

Analysis of 86 Cases of Leprosy of Floating Population in Shanghai HouYuHong Shanghai Skin STD Hospital

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Objective : Analyse the sources of leprosy patients, findings, and clinical features about millions of floating population in Shanghai between 1990 to 2006, in order to provide a basis for making related measures in the future. **Methods :** Collect and inspect out-patient cases of leprosy in our hospital since 1990, do statistical analysis for external floating population who are diagnosed as leprosy patients. Diagnostic criteria, classification and grading reference residual 11 "Leprosy Prevention Manual". **Results :** Since 1990, Shanghai has detected 100 cases of leprosy patients, which are among the floating population in 86 cases. They mainly come from neighboring Jiangsu, Anhui, Zhejiang which has been a high incidence of leprosy. In 86 cases, male and female ratio is 2.58:1 and in the mainly young and middle-aged. 62 cases (73%) to inquire positive bacteria, the disability of grads! 36 cases (42%). Contact history with leprosy were 14 cases (16%); Appointments to the incidence of 18.5 months. Most of the patients with erythema, plaque and / or nodular lesions mainly associated with varying degrees of peripheral nerve damage. Diagnosed before 79 cases went to various hospitals dermatology, neurology and other outpatients, some long and repeated outpatient treatment or hospitalization. One of them was misdiagnosed as a skin disease in 51 cases, neurological disease in 13 cases. 20% errors, missed time e" 5 years, 1 / 3 leprosy patients errors, missed e" 5 times Leprosy performance to be significantly before transferring to hospital diagnosed. **Conclusion :** floating population of leprosy patients in some cities in China under the new situation and new problems, their mobility, difficult to manage, consolidate and develop leprosy control is an important part of. medical personnel at all levels should be on high alert to the presence of leprosy. Update improve diagnosis and treatment of leprosy and inspection skills, early detection and treatment of patients rules guarantee is particularly important. **Keywords :** Floating Population, Leprosy, Analysis.

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Objective : To evaluate the prevalence trend and the experience on prevention and cure of leprosy in Shanghai. Expect to search for the optimization management on leprosy in Shanghai. **Methods :** Retrospective review the data of prevention and cure of leprosy. The total patients with leprosy were 5,441 patients with leprosy of inhabitant in Shanghai since 1954 to 2004. **Results:** We have got a great achievement of leprosy control in Shanghai. Many managements have been performed, such as nice prevention and cure net in all of the country, educated the special doctors and governors of leprosy, whole population survey, basic and recovery research work, domestic and international communication on leprosy, healthy education of the inhabitant, paying more attention to the patients with leprosy and so on. The incidence rate of leprosy have reduced from 2.92/100,000 in 1960s to 0.005/100,000 in 1990s. Only one patient was found in Shanghai in the last 10 years. The children with leprosy were common in 1950s and 1960s. However, no one patient was found after that time. **Conclusion :** Leprosy have been almost eliminated in Shanghai after doctors, governors, and other peoples contribution for 50 years. However, more and more fluid population came from prevalent regions of leprosy. Among them, some patients have been found in Shanghai in the last several years. Therefore, careful long-term surveillance for the fluid population especially from prevalent regions is mandatory.

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Objective : To compare the elementary knowledge about leprosy control among rural doctors in counties (cities, districts) of different epidemic levels, evaluate the effect of intensive health education training pattern and improve the ability to find the suspect leprosy cases of doctors in grass roots. **Methods :** The survey on related knowledge about leprosy control was conducted among rural doctors from 17 counties (cities, districts) in the form of unified questionnaire. After the doctors were trained by intensive training, they were investigated by the same questionnaire. The difference of the answers to the same questions before and after training was analyzed. **Results :** The average knowledge rate of the doctors from 17 counties (cities, districts) was less than 70% before training. After the intensive training, the doctors in project counties (cities, districts) primarily mastered the basic knowledge about leprosy control. **Conclusion :** There is not certain relation between doctors' knowledge rate and epidemic level. The training pattern of intensive health education is an effective and economical method to increase the knowledge rate rapidly and is worthy of extend. **Key words :** leprosy control; knowledge rate; rural doctors; training effect.

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Objective : To evaluate the achievement of Leprosy Elimination Campaigns and leprosy integrative control in liangshan and to explore the sustainable methods of leprosy control. **Methods :** The detecting rate of patients and acknowledge rate of leprosy control knowledge were elevated through governments instruction, adjustment of leprosy control agency, leprosy doctors training, health education, quality control, and rewards & punishments. **Results :** from 1995 to 2004, the number of average detected cases was 93.6 every year and the detecting rate was 2.38/100,000. After Leprosy Elimination Campaigns, the number were changed into 137 and 3.29/100,000 correspondingly. According to 2004, the detecting methods and construction were both changed in 2005. the 2nd degree disability rate decreased from 23.6%(2004) down to 18.25%(2005). The average delay periods of new cases shortened from 33 months(2004) to 25 months(2005). We checked the acknowledge rate by sampling 340 villagers and students from 17 counties and 34 villages, the acknowledge rate of village people and students was 45.6% and 75.42% respectively. **Conclusions :** The detecting rate of new cases arised obviously after the launching of LEC, the disability rate of new cases decreased, the primary achievement was gained after leprosy integrative control was performed in Liangshan.

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Analysis of New Recur Patients and Situation in the Counties at the Stage Towards Leprosy Elimination in Gansu, China

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Objective : To analyze the situation of newly recur diagnosed leprosy patients in the past 10 years in 71 counties at the stage towards leprosy elimination in Gansu Province. **Method :** The data on newly diagnosed leprosy patients from 1996 to 2006 in the 71 counties were analyzed. **Results:** 64 new cases including 49MB and 15PB were detected in 71 counties. In family 29 cases 45.31% y. Out of them, 22(34.38%) were disabled. Skin smear was positive in 76.56% of cases. 12 cases (15.58%) were detected through active case-finding methods and 65 cases (84.42%) by passive case-finding methods. The duration of the leprosy was within 2 years in 26 cases. The 13 recurred cases including 10 MB and 3 PB were detected in 71 counties. 11 recrudescence cases after recovered for 20 years were detected. The prevalence was over 0.1/10000 in 3 counties. The incidence was over 0.5/100000 in the recent 5 years in 5 counties. **Conclusions:** There is not a rebound in leprosy in Gansu province and more effort should be made to detect hidden leprosy cases as early as possible. **Key words :** leprosy; case-finding.

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The Integration Management of the Public Health Can Affect the Prevention and Cure of Leprosy

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Objective : Observed whether the integration management of the public health can affect the prevention and cure of leprosy. **Method:** analysis data about the incidence of the leprosy before and after 1991 when we carried out the integration management of the public health. **Results:** There were 43 new cases in 30 year, average 1.43 cases and the incidence was 0.57/100,000 per year. 2-grade mutilation and average lag period decreased from 1991. New patients received regular therapy and rehabilitation service, and promoted public health fair, and cost/efficiency of the prevention and cure of leprosy was raised, and had a good effect in consolidating and promoting the achievement of the prevention and cure of leprosy. **Conclusion:** The integration management of the public health can decrease the incidence of leprosy, may be an aspect the prevention and cure of leprosy. **Key words :** The integration management of the public health; The prevention and cure of leprosy.

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Leprosy Inspection Result Analysis of Wuzhou from 1996-2006

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Objective : Probe into future prevention strategies according to research in leprosy cases from 1996 to 2000. **Method:** Look-back analysis on leprosy cases found over the past 11 years. **Result :** There are 38 leprosy cases in total and the discovery rate is 0.03~0.18/100000 in every year. The male case over the female case would be 2.8:1, 33 newly found cases and 5 recrudescence cases. **Conclusion :** WuZhou, as a leprosy low-cause area, has thoroughly spread out its influence of prevention network including skin prevention organization 0 villages and towns 0 communities, mainly through professional clinic, clue research and physical examination for kins of patients, which are equally important for case detection during early stage. **Key words :** Leprosy Inspection.

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Objective : To study the effect of MDT to patients found in leprosy. **Method :** During 20 years MDT in local area, the clinical data from the new patients found, including sex, age, type, postpone diagnosis, naturally distribute et al. were analyzed comprehensively. **Results :** new patients 74 cases were found, Mb 39 cases, Pb 35 cases. The average age was 51.2 years old. The five years measure average descend speed was 37.73%. In the nature epidemic focus, the cases after ten years in MDT, were 12.12% less than before. It showed that the local leprosy epidemic degree could be reduced after MDT. **Conclusions :** If MDT covering rate reaches 100% and rule treatment rate is more than 95%, it will obviously lessen leprosy case-finding. **Key words:** Leprosy; MDT; case -finding.

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This paper presents the outcomes of self-care as practiced by people who were members of self-care cells in 3 districts of South East Nepal. All people with plantar sensory loss had also been supplied with protective footwear. Each self-care cell was lead by a peer facilitator who had undergone facilitator training at Lalgadh Leprosy Services Center. Using impairment summary forms, the changes in the impairments of 214 people were tracked. Data were collected at baseline and after one year. Only data that describe anhidrotic fissures and ulcers on hands and feet, and lid gap and inflammation of eyes is presented in this paper. After one year it was recorded that 97% of all ulcers had healed and that over 50% of all Anhidrotic fissures had been resolved. A small number of people presented with lagophthalmos or eye inflammation at the start of the program. Most of these impairments were well managed. A conclusion is that there is sufficient evidence to state that self-care (with a supply of protective footwear) is a good intervention for uncomplicated secondary impairments of the skin and eyes and that self-care cells facilitated by leprosy affected peers can be effective.

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Introduction : The estimation of the proportion of new cases presenting physical incapacities (grade I) and deformities (grade II) is known as hidden prevalence and has been used to estimate the patients that were not diagnosed during the period of the study. The hidden prevalence is used as epidemiological indicator to value the delay on the diagnosis of leprosy. If the diagnosis of leprosy is made as early as possible, the proportion of incapacities patients will be smaller. We estimated the hidden prevalence of leprosy during the period 2001-2005, in Minas Gerais, Brazil. **Methodology :** The present study is a retrospective, descriptive and exploratory analysis of a population of patients whose medical condition was notified to the Sistema Nacional de Informações de Agravos de Notificação (SINAN, Minas Gerais, Brazil) during the period 2001-2005. The hidden prevalence was estimated in according to the methodology proposed by Panamerican Health Organization in 1998. **Results :** The estimation of the hidden prevalence of the disease indicated that 6.407 cases (28,4%) were not diagnosed during the period of the study. The estimation of the real prevalence was 22.596 patients; in other words, only 71,6% of the new cases of leprosy were diagnosed in the period of the study. **Conclusion s:** The results obtained indicate that the diagnosis of leprosy has been late and indicate operational problems. Since the risk of physical incapacity in the new cases remains very high, further intensive strategies must be employed in order to address this problem. **Keywords :** leprosy, hidden prevalence, physical incapacity.

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Elimination of Leprosy in India is a great achievement. Early treatment of the disease protects the new cases from deformities, social stigma and also from isolation. Lacs of leprosy cured persons, who isolated three or four decades back due to social stigma are settled in Asylums in all over India and even today they depends on alms for livelihood. They got medical relief but much more is to be done to change their life values. Leprosy affected persons are the most neglected and deprived section of the society since decades. After declaration of elimination of Leprosy in India the Govt hasn't taken any steps for the Socio-Economical Empowerment of the affected persons. Strengthening them economically is only the way to bring them in to mainstream. Otherwise they live in poverty and opt beggary for their livelihood as before. The Govt has made reservations for some other weaker and deprived sections like S.C., S.T. etc. and helping them in all spheres to regain their Social Status and also to strengthen them economically. The 11million leprosy affected persons are also deserve some reservations from Govt so that they may able to come up form the present worst living conditions and also their children may achieve employment by having good education and training. Also some proper mechanism should be set up to provide physical rehabilitation and to continue proper supply of drugs for the affected to prevent further deformities of the cases which the present affected persons facing though it is not fault. **Keywords :** social and economical conditions of leprosy affected persons.

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Predictive Factors in the Evolution Disability Grade of Leprosy Patients Attended in the Health Center/Belo Horizonte – MG, from 1993 to 2003

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Aim : The aim of the present study was to determine the predictive factors which contributed to change in the WHO disability grade of leprosy patients attended by the physiotherapists of Barreiro Health Center /Belo Horizonte-MG, from 1993 to 2003. The retrospective cohort involved 595 patients. **Methodology :** A descriptive analysis of the sample was made. Later a univariate analysis, and a multivariate analysis, through the ordinal logistic regression model, to verify the predictive factors of disability at diagnosis. Finally, the disability grade at diagnosis and release from treatment were compared using the marginal homogeneity test, followed by a univariate analysis, and a multivariate analysis using the CHAID tree. **Results :** Gender, age and number of nerves involved were predictive factors for the disability grade at diagnosis. A positive dynamics was verified regarding change in disability grade, when comparing diagnosis to release from treatment. The disability grade at diagnosis is the main factors that predict the evolution of the disability. The present study showed the need for early diagnosis of neuropathy as well as an efficient association of pharmacological and non-pharmacological treatment.

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Census of Disabilities of Hansen's Disease in the State of São Paulo in the Year, 2005

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Objective : describe the prevalence of disabilities for Hansen's disease in the State of São Paulo in the year of 2005. **Methodology:** The source of information was a database of the evaluations of disabilities of people burdened with Hansen's disease that were in treatment or had obtained cure and received treatment over the last three years. 4072 formularies were analyzed being 1872 (46%) in PQT and 2195 PQT conc. The frequency of modifications of the nose, eyes, hands and feet were calculated. **Results:** Of the 4039 formularies that were selected 3436 (85%) were registered five years ago or more. Almost 44% of cases presented some degree of disability, being 21% with moderate or severe disability. Through the SINAN-Hansen's disease, 7,7% of new cases were second degree of disability and 9,4% were noted at the moment of the discharge form the program in 2005. An ocular evaluation showed 6,7% of disability of the second degree and 0,9% of severe visual deficiency. The cases with some degree of disability of the hands was 23,5% and 34% of the feet. Both regional have second degree incapacity in 10% of cases. **Conclusions:** The existing information about disability secondary to Hansen's disease, processed through SINAN-W showed differences and very little specificity when compared to the informations obtained by the Census-2005. This gathering of informations gave the opportunity not only to evaluate more precisely, like also allowed a study of a segment of the population not collected by our formal information system and that also required preventive, curative and rehabilitation activities. The strategy used can help in the planning and necessary definitions for the actions in primary care and in activities of medium and high complexity.

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Ulcers In Leprosy Patients : Clinic-Epidemiological Evaluation and The Use of Low Level Laser Therapy

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Neuropathic ulcers are one of the most stigmatical sequels of leprosy, but little is known of the clinical and epidemiological aspects of this process. The main goal of this study was to analyze clinical and epidemiological characteristics of patients attended at the dressing service of Dr Marcello Candia Reference Unit in Sanitary Dermatology of the State of Pará (UREMC) in Brazil. Anamnesis, identification of the regions affected by the lesions, photographic register, evaluation of the ulcer area with *ImageTool 3.0* and depth measure were done in 51 patients. The mean age was 59.9 yo and 78.4% were males, with a mean period of 27.6 years of diagnosis and 11.6 years of discharge by cure. A total of 97 lesions were identified, 54% on the plants and 40% on the ankles, 4% on the dorsal part of the feet and 2% on the hands. Mean evolution period of the ulcers was 97.6 months, area 7.3 cm² and depth 6.0mm. Low level laser therapy has been used 3 times a week in 13 patients, but until now there is no evidence of improvement more than the control group. **Acknowledgments :** This work was supported by Secretaria de Ciência, Tecnologia e Insumos Estratégicos, Ministério da Saúde do Brasil, by Conselho Nacional de Pesquisa do Brasil (CNPq) and by Financiadora de Estudos e Projetos do Governo Federal, Ministério da Ciência e Tecnologia (FINEP 1460/03). **Key-words :** leprosy, ulcers, low level laser therapy.

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Sensory Impairment of Ulnar, Median & Radial Nerves on Volar & Dorsal Aspects of Hands of Hansen's Disease Patients in Israel

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Introduction : The aim of this study was to describe sensory impairment (SI) as detected by Semmes-Weinstein Monofilaments, in the ulnar, median and radial nerves on both volar and dorsal aspects of the hands and compare the frequency of SI between the nerves on both aspects. **Methodology :** A cross-sectional study of 159 patients registered at The Israel Hansen's Disease Center was performed. Three sites were tested on both volar and dorsal aspect for each nerve. **Results :** SI was significantly more frequent on the dorsum of the hands. The frequencies of SI for the nerves in descending order were: The dorsal ulnar 52%, radial 44%, ulnar volar 35%, median dorsal 31% and median volar 22%. All statistical analysis using different outcome measures pointed out to the same results. **Conclusion :** SI on dorsum of hands occurs more frequently than on the volar aspect, therefore dorsal sensory testing should always be tested and even precede volar sensory testing. **Key words :** sensory testing, dorsal sensation.

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Trend In Foot Disability Among New Leprosy Patients Attending A Referral Hospital In Nepal

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The purpose of this study was to assess the prevalence and severity of foot disability among new leprosy patients over the years for appropriate intervention. All new leprosy patients diagnosed from 2002 onwards in Anandaban hospital were enrolled in this study. WHO disability grading and ten point disability coding were used to measure the severity of foot disability. On an average 18% of new leprosy patient had grade I and 12 % had developed Grade II foot disability at diagnosis. MB and old patients above 46 year of age had suffered more foot disability in comparison to PB and young patients. There is no significant change in the trend of prevalence over the years. Foot disability among new leprosy patients is significantly high in comparison to national figure (4.8% Grade II disability). **Key words :** foot disability, trends in disability.

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Patients' Self-Reported Symptoms as Indicators for Change in Nerve Function in Leprosy : Conclusions from the INFIR Cohort Study

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The objective of the INFIR Cohort Study was to evaluate a range of neurological assessments as indicators of early changes in nerve function in leprosy. A full range of nerve function assessments was made monthly in the first year and bi-monthly in the second year of follow-up. These included clinical, nerve conduction and thermal sensation assessments. In addition, patients were asked to report any recent weakness, decreased sensation, dryness, paraesthesia or nerve pain in bilateral upper and lower limbs. Using monofilament and voluntary muscle testing as the gold standard a series of analyses has been completed that assess patients' self-reported symptoms as predictors of change in nerve function or the onset of a reaction. An initial analysis compared self-reported symptoms with nerve function and reaction status at time of diagnosis. A second analysis assessed the predictive value of self-reported symptoms in advance of incident reactions. Finally, the analysis was extended to assess the relationship between self-reported symptoms and changes in warm and cold sensation and measures of sensory and motor nerve conduction. Conclusions draw attention to self-reported symptoms that are related to changes in nerve function requiring diagnosis and treatment.

Limitations of Activities of Daily Living and Social Participation in Dutch Leprosy Patients with Impairments

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Limitations of activities of daily living and social participation in Dutch leprosy patients with impairments. Introduction Leprosy related neuropathy leads to impairments such as skin lesions, hand and foot deformities and eye lesions. Impairments may result in limitation of activities of daily living and restrictions in social participation. Purpose of this study was to do a survey on the prevalence of impairments and their association to perceived restrictions in participation in leprosy patients. **Methodology :** Prevalence and severity of impairments was assessed in Dutch leprosy patients using a purpose-designed questionnaire. Perceived restrictions in participation were studied using the Impact on Participation and Autonomy questionnaire (IPA). Results Of 82 returned questionnaires (61% response rate), 93% of the patients reported one or more impairments; 93% foot, 89% hand and 68% eye impairments. WHO disability grading: 9.8% had grade 0, 18% had grade 1 and 65% had grade 2 disability. IPA showed no differences in perceived restriction in participation between grade 0, 1 or 2. Perceived restriction in participation was lower compared to patients with other chronic diseases. **Conclusions :** Although the majority of patients suffered from severe impairments, they did not seem to perceive severe restrictions in participation. Whether this indicates that patients are not experiencing problems also depends on the social impact of leprosy, which is under investigation. **Key words :** Neuropathy, impairments, leprosy, disabilities.

Self Care Groups and Ulcer Prevention : The Okegbala Experience

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Introduction : The study looks at the impact on plantar ulcer prevalence in 3 self Care groups in Okegbala Community, Kwara State Nigeria from 2004 -2007. **Methodology :** 24 people affected by leprosy attending 3 self care groups in Okegbala Community participated in the study. The study combined quantitative data from impairment and admission records, with semi structured interviews of group members, 3 group discussions and 10 key informant interviews. **Results :** 50% of group members who had ulcers in 2004 had no ulcer by May 2007. Mean re-admission interval for ulcers among group members has increased from 11 months between 2000-2003 to 18 months between 2004 and 2006. 100 % of group members feel that they are now able to care for themselves and prevent and heal ulcers. 95.5% feel that their physical health has improved as a result of being a member of the self care group. **Conclusions :** Self Care Groups have had positive impact on the prevalence of plantar ulcers among residents of Okegbala Community. **Keywords :** Self Care groups, ulcers, Nigeria.

Effectiveness of POD Services by Community and GHCS

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Introduction : LEPRA Society started a community based leprosy project in October, 2001 with a population 369357 and the disability rate of 6.1. One of the important activities of the project is to involve community and GHS staff in POD care. Accordingly the community and GHS was prepared and the POD care is transferred. The objective of the study is to assess the adequacy of community service on the POD care. **Methodology :** The study was carried out to know the status of 1063 patients managed by 74 POD kit holders under 20 Health Resource Centers (HRCs). The years 2002 to 2004 were spent in selection of stake holders, capacity building and conducting POD care along with stake holders. During 2005, activities have been transferred to community along with 74 POD kits of self-care and dressing material. **Results :** The effectiveness of service provision in 2006 is as follows :

- 254 patients (23.9%) have become self reliant in self-care practices, • Care of 221 patients (20.8%) is taken over by partners
- GHS staff is taking care of 167 patients (15.7%), • HRCs are taking care of 113 patients (10.6%), • The project is taking care of 308 patients (29%), • 54 new nerve function impairments recovered.

Conclusion : About 70% of POD care is being shouldered by the community. **Key words :** Disability rate, POD, HRC.

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Multidrug therapy (MDT) has proven effective in its bactericidal action and stopping the progression of the disease. However, some patients are liable to show no improvement or even degrade while on MDT. In order to investigate the extent of this problem, untreated leprosy patients attending our referral hospital were studied in terms of WHO grade of disability, EHF score and BI at start of MDT and at RFT. A retrospective cohort study was done on a sample of 210 new leprosy patients, 143 male and 67 females who completed MDT during 2006-7. There were 15(7%) children. 186(77%) were MB and 69(33%) had Grade 2 disability. Only 118(56%) had an EHF score of 0 and in 173 (82%), had negative bacterial index. At RFT, the WHO grade was unchanged in 179 (85%) patients, improved in 26(12%) and deteriorated in 5(2.4%) patients. In EHF score, at RFT, 157() remained unchanged, 40() improved and 13() deteriorated. In Bacterial index, there was decline in 31() and a slight increase in 2() patients. These findings are presented by age, sex and type of leprosy and the implications discussed. It is necessary to ensure that patients show improvement while on MDT, and investigate cases that deteriorate. **Key words** : nerve impairment, MDT in leprosy.

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Introduction : The objective of the study is to find out the most suitable or effective footwear to prevent plantar ulcer in leprosy patients with anesthetic feet. **Methods** : A single centre based study of 50 leprosy patients with anesthetic feet, in TLM hospital Champa were followed up around 4 months. Those leprosy patients with anesthetic feet without ulcer and willing to be enrolled were eligible. All the patients undergone Foot Posture Index and podiatry assessment (Redmond et al, 2004), and calculated the pre-intervention foot score. They were allowed to select their own suitable footwear by demonstrating some models in the OPD. All those patients were followed up on their visit to OPD around once in 2 months for about 4 months. Those were assessed for the foot score and history of plantar ulcer incidence in between the period of study. **Conclusions** : Most of the patients received traditional MCR footwear still develops plantar ulcers, and it seems that most of the patients are not using the traditional MCR due to its design and may be social stigma. So, there is a need to give freedom for the patients to select their own suitable footwear which the patient feels comfort. **Key words** : footwear in leprosy, MCR in leprosy.

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In order to know the common reasons for failure in practice of self care among the Leprosy affected, a questionnaire study has been conducted through developing a profile of those who develop recurrent ulcer and those who do not, for comparison in terms of knowledge of self care and other factors. The data were collected from ulcer patients living in the colonies as well as those living outside the colonies, randomly selected from the Hospital readmission list by door to door. Various reasons for failure in the self care, expressed by the respondents include that they had not been aware of the importance and benefits of self care practices. Some express that they are not having a sufficient knowledge on self care. And some feel that they were neglected due work and society. Another group of people are of the opinion that individual practice of self care is difficult in self care practice, which could be the main reason for failure. The paper also presents other causes for negligence of self care, which may help to design effective methods of self care and teaching in future in order to prevent recurrent ulcer. **Key words** : MCR footwear, reasons for failure.

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Neurolysis in Patients with Leprosy : An Alternative Treatment in Resistant Neuritis the Corticotherapy

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In Brazil, there are still many people living with disabilities, resulting from chronic leprosy neuritis. Oral corticosteroid therapy is the standard treatment of neuritis. In case of unsuccessful treatment, neurolysis may be indicated. To assess the degree of sensory and motor loss before and after neurolysis, we performed a retrospective study. Leprosy patients were included, that had received neurolysis of peripheral nerve trunks in the reference hospital of Rondônia State (North Brazil). To assess semi-quantitatively the degree of sensory and motor deficiencies, we created an ordinal score based on the clinical evaluations. Of the 118 individuals included (in total 297 neurolyses), 81.4% patients were classified with borderline leprosy. Only 53.4% of the patients were under multi-drug therapy at the moment of neurolysis. The median time between the first episode of neuritis and the surgery was one year. Ninety % of patients with severe sensory deficiency before surgery presented with an improved score after neurolysis. The clinical classification and the period between the first episode of neuritis and surgery did not modify the clinical result significantly. The data of the present study indicates that neurolysis is of important benefit in leprosy neuritis, even after a prolonged period of neuritis. **Keywords :** Hansen's Disease; Neurolysis, Neuritis.

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Retrospective Analysis of Cases with Nerve Function Impairment Treated in LEPRO Hyderabad Leprosy Referral Centre in an Integrated Leprosy Programme Setting

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Following integration of leprosy services into general health care, MDT services are provided at urban health posts. Patients presenting with complications are referred to LEPRO Hyderabad leprosy centre for nerve function assessment and treatment. The centre caters for specialised treatment for complications particularly those with nerve function impairment. During the study period of four years from 2003 to 2006, 791 patients were registered for MDT. Among these 182 were referred for treatment of complications. The centre registered 195 cases from villages outside the district of Hyderabad In addition to the 596 referrals from Hyderabad. These 791 cases were assessed for nerve function impairment. Cases with nerve function impairment of 6 months duration were treated with a standardised regimen of steroids and supportive physiotherapy and provided suitable foot wear. Nerve function status was assessed at the end of 6 months and 24 months using a standardised nerve function assessment protocol including sensory testing with SW monofilaments and muscle function testing with MRC grades. Age and gender distribution, clinical classification, MDT status of these 791 cases are presented. Nerve function impairment was observed in 137 cases of whom 86 showed improvement subsequently. Observations from analysis of nerve function status at the end of 6 months and 24 months will be presented in the paper.

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The Role of Splints in Prevention of Disabilities in Patients with Leprosy under DPMR Programme

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Various types of Physical Medicine and Rehabilitation Techniques can prevent correct, or reduce disabilities in patients affected by Leprosy; through teaching, treating and helping the patients, they can be made to live as normal people live, SPLINTs play an important role and often the most essential one among the physical techniques used. SPLINTS are effective economical convenient to use and well accepted by patient not only in the hospital set up but also in the field level, on various states of leprosy like, Neuritis, Early Paralysis, Early Paralysis established paralysis, during surgery, pre-operative, post operative, home self care, Neuropathic foot, non healing. Non infected ulcers fractures and Reactional state. The type of SPLINTS used in each of above mentioned condition and resultant effects are shown as exhibits (models and photos). Patient, who have used these SPLINTS in our centre have shown improved physical abilities and are a very satisfied lot. This has encouraged us to share these effects with all PARTNERS who are engaged in DPMR Programme in national level not only in Leprosy but in General Health Care Rehabilitation programme as well.

Knowledge and Practice About Wound Prevention and Management Among Patients Affected by Leprosy

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The prevention and management of wounds and injuries in persons affected by leprosy is an important component of any Prevention of Disability (POD) program. After integration of leprosy into the general health services in 1997, prevention of impairment and disability (POID) services were provided in 3 out of the four blocks of the erstwhile Gudiyatham Taluk. A community-based POID program was initiated in 2000, which involved visiting patients at home based on a priority list prepared. They were taught self-care, self wound management, and efforts were undertaken to involve the family and community. The objective was to assess the knowledge and practice about wound prevention and wound management among persons cared for through the CBPOID program (Block 1) and compare it with those who did not have a CBPOID program after integration (Block 4). From our database 50 persons from block 1 and 50 persons from block 4 were selected randomly. A questionnaire on knowledge and practice of wound prevention and management was administered. The data collected is being analyzed and the results will be reported.

Disability Prevention and Medical Rehabilitation Program – A Camp and Workshop Approach to Integrate These Services

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Disability Prevention and Medical Rehabilitation program aims at activities which results in prevention of impairments and disabilities, correction of existing disabilities and prevention of worsening of disabilities. It aims at decreasing the disability load in the community. Medical Rehabilitation focuses on bringing back the functional abilities as well as cosmetic correction of the affected limbs resulting in removal of stigma associated with visible disabilities followed by economic rehabilitation so that persons can start using reconstructed or healed limbs for gainful employment. NCLCA supported reconstructive surgery workshops for persons affected by leprosy with visible disabilities e.g. claw hands, foot drop, lagophthalmos, plantar ulcers and facial paralysis at the Tata Department of Plastic Surgery, Grant Medical College and Sir J.J. Group of Hospitals, Mumbai, in collaboration with the Directorate of Health Services, Government of Maharashtra. These workshops were carried out with the objective of reaching reconstructive surgery to visibly disabled cases as integrated approach and to transfer surgical skills to resident doctors and plastic surgeons who participated from various hospitals from the city like St. George Hospital, LTMG Hospital, Nair hospital, KEM Hospital, etc. The patients referral for reconstructive surgery was the outcome of camps conducted by NCLCA for about 150 leprosy disabled in Thane, Bhivandi, Vasai and Kalyan in Maharashtra. The follow up camps has shown very encouraging results in terms of improvement in the function and cosmetic correction as well as thrown light on the necessary insight in carrying out this activity in other hospitals in an integrated manner. The health services staff visited them and learnt on the rehabilitation needs for economic rehabilitation to be offered by NCLCA. One program of economic rehabilitation was carried out by NCLCA at Vasai to be followed at other places. Good results are cited and important lessons learnt are enumerated.

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With the excellent results of Comprehensive Care in India, the Novartis Foundation for Sustainable Development introduced the disability prevention, correction and care at Sri Lanka in 1993. Comprehensive care entails reaching the disability prevention, correction, care and rehabilitation services in conjunction with the treatment of leprosy and thereafter. The program adopted a multi-pronged, systematic approach. It standardized the data collection and analysis of the overall burden of disability in an area for better planning. It trained health care staff such as orthopedic and plastic surgeons, medical officers, general health workers and physiotherapists. The training involved all aspects of care including MDT, reaction management, splints, grip-aids, ulcer care kits, MCR footwear, etc along with reconstructive surgery and rehabilitation. Field area camps by the authors were mainstay to deliver the disability care services and provide on the job training. Camps were arranged and follow up was carried out by the PHIs and REs. Following the integration of leprosy into general health services, the physiotherapists and dermatologists were trained to establish disability care at their departments as first level of reference. People's participation in their own health is an essential component. With the application of splints hand deformities have improved in nearly sixty percent of cases. Nearly 40 percent cases empowered with the ulcer care kit could heal their ulcers without attending any clinic or hospital. About five hundred cases were provided MCR footwear from India. However, what is more important is that all splints, self-care kits and MCR footwear are being made locally. Reconstructive surgery was initiated at NHSL since a few years ago and is gradually being extended to district level with the training of interested orthopedic and general surgeons. The overall response has been most encouraging, as in the high endemic district of Matara, an improvement in the condition of 90% of cases disabled by leprosy has been reported. Review of activities demonstrate that patients now have better access to disability prevention, care and correction components even in the integrated system.

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1. Search for any crack/injury/worn/Hot area/Blister, 2. Soaking in water 15 to 20 minutes daily, 3. Soften with oil to preserve moisture, 4. Scrapping with rough surface/cloth, 5. Shaving of thickened skin, 6. Sitting properly to prevent callosity, 7. Short Step at a stretch In Ulcer Develops, 8. Short time at a stretch 9. Short distance at a stretch, 10. Slow 11. Show-MCR – Free from Nail, Wire, 12. SCAR Take Care of 13. Swollen area 14. Seek proper advice 15. Systematic care 16. Self dressing In ulcer Develops Strict bed rest.

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Reconstructive surgery (tendon transfer) to correct or minimize deformities and incapacities in leprosy can lead to important changes in the lives of people affected by this disease. This study aimed to describe the functional changes after tendon transfer in face, hands and feet of the affected people; to identify their perceptions to reconstructive surgery and to assess patients' quality of life in the face of the changes occurred by the physical rehabilitation process. The following instruments were used: questionnaires (WHOQOL – Bref and Participation Scale), one question about what they expected from the reconstructive surgery and another one about the benefits of it; the Visual Numeric Scale, the Jebsen-Taylor test and goniometry for functional evaluation. The majority of the group revealed a good quality of life; they have a perception of improved cosmetic appearance and increased social inclusion. **Key words** : leprosy; quality of life; physical therapy; surgery.

P-238**Patient Satisfaction After Reconstructive Surgery Among Leprosy Affected Person in Anandaban Hospital, Kathmandu Nepal**

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Leprosy is a disease commonly affecting peripheral nerves which leads towards disability and deformities. Many disabled leprosy affected people have had disabilities corrected in Anandaban Hospital. One of the main aims of this study is to find out satisfaction after surgery among leprosy affected people. This study also helps to find out the role of different surgical and physiotherapy procedures among eighty three (83) leprosy affected disabled peoples. This study will not cover the actual situation of their living places. This study will be retrospective, assessing about eighty three (83) leprosy affected peoples who have been operated on in Anandaban Hospital during 2005 to 2007. Method has been used for satisfaction 0 – 10 standard scales. Result and findings will be discussed at presentation.

P-239**Improvement of Function of Hand After Reconstructive Surgery in Anandaban Hospital Nepal**

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In a six years period, 133 reconstructive surgeries of the hand were performed in Anandaban Hospital, Nepal. 5 doctors were involved in these operations. 85 surgeries were for correction of fore fingers and the remaining 48 surgeries were for opponens. The function of the hands was assessed one week prior to surgery. Then the subjects were taught exercises after 4 weeks from the date of surgery. Functions of the hands were assessed again after 8 weeks from the date of surgery. Second assessments were carried out after three months from the date of surgery. Results show that the recovery rate of the function of hands is variable depending upon the other condition of the hands. **Key words** : reconstructive surgery in hand, reconstructive surgery in leprosy.

P-240**Wound Coverage of Heel Ulcers in Anesthetic Feet in Leprosy - A Seven Year Study**

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Chronic heel ulcers are frequently seen problems in anesthetic feet in leprosy. Many flaps have been described in the management of small defects of the heel. These range from simple local flaps to micro vascular free flaps. In Premananda Memorial Leprosy Hospital, in the course of seven years (between January 2000 and December 2006) we have seen a total of 245 heel ulcers in anesthetic feet due to leprosy. 162 surgeries were performed on 129 cases. Procedures included calcaneal paring alone (8 cases), local rotation flap (51 cases), medial plantar artery island flap (49 cases), cross thigh flap (14 cases), and reversed sural artery flap (6 cases) as the first procedure. 32 cases underwent more than one surgery. The duration of ulcers prior to the surgery ranged from 1 month to 15 years. The follow-up period ranged from 1 month to 4 years. Healing time after the surgery ranged between 16 and 45 days. Complications seen included wound infection (9 cases), haematoma formation (2 cases), recurrence of a sinus (21 cases), partial flap necrosis (10 cases) and eczema of the flap (2 cases). Donor site problems were seen in medial plantar island flaps (6 cases). Recurrence was seen in local rotation flaps (10 cases) and in reversed sural artery flaps and cross thigh flaps (11 cases). Recurrence was not a problem with medial plantar artery island flaps. **Key words** : heel ulcers, flap surgery.

A Follow Up Study of Surgical Correction of Ulnar Paralysis

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Introduction : Isolated ulnar paralysis is a common problem of the hand in leprosy. Over a period of 5 years between January 2001 and December 2005, 57 patients underwent surgery for the problem of isolated ulnar paralysis. Follow up period ranged between 3 months and 60 months. Active muscles used for transfer were middle finger superficialis in 4 cases, Palmaris longus in 29 cases, Extensor Carpi Radialis longus in 24 cases. Insertions were either to the lateral band of the dorsal expansion in 26 cases (of which 4 needed dorsal fixation of the lateral bands) and A1 pulleys in 31 cases. **Methods :** They were analysed comparing preoperative unassisted angles and post operative unassisted angles for appearance showing an improvement in all cases. Function was assessed by grasp contact, grasp power, pinch power and buttoning and unbuttoning, showing significant improvement in grasp contact and buttoning and unbuttoning and a status quo in grasp power and pinch power. **Conclusion :** Our results serve to indicate that tendon transfer procedures help in improving appearance and coordination of function, but not in increasing power. **Key words :** surgery, ulnar paralysis.

"Grip-Aid Kit" - A Simple Method to Facilitate Activity of Daily Living in Advanced Hand Deformities

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Epoxy resin grip-aids (Modulan®) were pioneered by Novartis Foundation for Sustainable Development orthopedic and leprosy handicaps. Though its importance can not be neglected, its non-availability due to high cost of production and shipping did not allow it to become household entity. M-seal®, the local epoxy resin is being used as substitute but has the same disadvantage of spending more time in its making and has to be tailor made for the deformity. Its application on many articles is also time consuming. Moreover, patient has to learn to adjust the deformities in the crevices of the mould on the article otherwise it may mismatch causing friction. In order to obviate these disadvantages, our research has resulted in prefabricated "Grip-Aid Kit". The kit consists of a Grip-Aid made of Velcro and rubber which can be easily worn on the absorbed or short stumps of the hand. It consists of utilities like spoon, tooth brush, tooth paste, comb and a handle for holding glass which fits in to its straps. The learning curve is minimal and benefits are observed instantly. It does not have disadvantages of epoxy resin mentioned earlier. This innovative kit has been found extremely useful in the field areas, particularly for the patients with grossly deformed hands. It has been also used by us in burns and other trauma, thereby making it an integrated care modality. Patient acceptance is good and relatives and staff of the hospitals feel joyous that patient has attained ergonomic independence in activity of daily living. Results are encouraging. In this poster we make a case for its large scale adoption as modality of disability care and community based rehabilitation as this "Grip-Aid Kit" can be easily assembled.

Antimicrobial Drug Resistance in Bacterial Species Infecting Leprosy Plantar Ulcers

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Background : Present study was undertaken to identify the bacterial species causing secondary infections of plantar ulcers and to evaluate the drug susceptibility profile. **Methodology :** Pus swabs from infected plantar ulcers of leprosy patients treated during 2004-2005 were studied. Inoculation of pus swabs on blood agar and Mc Conkey's agar and antibiotic susceptibility tests by Kirby Bauer disc diffusion method, were carried out as per the standard techniques. **Results :** Out of 582 specimens studied 445 yielded bacterial isolates of different species. *Proteus* sps (40%) and *Staphylococcus* sps (30%) were the most predominant isolates followed by *Enterococcus* sps, *Klebsiella* sps, and *Pseudomonas* sps. Most of the isolates showed high degree of resistance to Tetracycline (81%), Co-trimoxazole (80%), Ampicillin (61%), Ciprofloxacin (60%) and Gentamycin (58%). Broad spectrum antibiotics such as Amikacin (31%) and Ceftroxin (33%) were inhibitory. **Conclusion :** Empirical antibiotic treatment with commonly used antibiotics may not be sufficient to treat infected plantar ulcers of leprosy patients. Periodic studies on bacterial species and their antimicrobial resistance patterns may help in developing antibiotic policies, specific to each clinical setting. **Key words :** Plantar ulcers, drug susceptibility, *Proteus* sps, Amikacin.

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Introduction : Because of its pathophysiology the A-wave was chosen to identify parameters related to neuropathic pain (NP) in leprosy reactions. **Method :** In a clinical trial to assess steroid treatment, 28 ulnar nerves, 19 T1R and nine T2R, were followed-up during six months. The presence of A-wave was checked in samples of 20 F-waves at each nerve assessment. The clinical and the neurophysiological findings were compared, in order to note the positive and negative concordances between neuropathic pain symptoms and A-wave: before and after steroid treatment. **Results and Conclusion :** Both reactions presented high frequency of A-wave but the parameters concordances before and after steroid treatment were encountered in the T2R group, they were positive in 44% before treatment and this was not observed after treatment. Negative concordances were not present before treatment but were most frequent at the end, 88.9%. In the T2R group double correlation was therefore observed, positive before treatment and negative after. The results were statistical significant suggesting an association between the A-wave and NP in T2R. **Key words :** leprosy, neuropathic pain, neurophysiology, A-wave, axonal reflex.

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Objective : To propose an electronic method for the evaluation of leprosy patients and to compare it to the use of Semmes-Weinstein monofilaments. **Methods :** Thirty patients were evaluated at the Dermatology outpatient clinic of HCFMRP-USP. Each patient was consecutively evaluated by both methods at hand and foot test points. The intraclass correlation coefficient (ICC) was calculated to determine the variability of the electronic measures and the kappa coefficient was calculated to determine the agreement between methods according to their categories (altered and non-altered sensitivity). **Results :** The ICC was approximately 1, demonstrating repeatability. The kappa coefficient showed more than 75% and 63% agreement in the hand and foot points, respectively. The mean agreement between the 2 methods for the 7 points of the right and left hand was 77.14% and 75.71%, respectively. The mean agreement for all 10 points was 74.33% and 63.66% on the right and left foot, respectively. In cases of disagreement on the right and left foot there was a predominance of 90.91% and 84.25%, respectively, for the detection of altered sensitivity by the electronic esthesiometer, with no detection by the monofilaments. Despite the agreement of altered and non-altered sensitivity determined by the kappa method, the absolute values obtained by the two methods were different, probably because of variables of each method. **Conclusion :** The results obtained with the electronic esthesiometer seem to be reliable because of the strict method used for its application. Thus, the electronic esthesiometer proved to be a method of easy application, capable to evaluate the alterations of sensitivity in leprosy patients.

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Purpose : Foot camp was a new method that Anandaban hospital, Nepal used to reaching out in the community to catch up hidden cases of leprosy at early stage with minimal disability. And to provide self care teaching and necessary intervention to those with physical disabilities. **Methods :** 23 camps were conducted in 10 districts of central development Region of Nepal since 1999. Four hill and six terai districts were covered. Expert team from Anandaban hospital and concerned government health staff is used. **Result :** New leprosy cases from small focus group with foot disability were detected. Defaulters, Relapse and reactions were identified and managed to prevent and minimize disability. More new cases were found in terai district. Disability rate was found higher than expected. (28 % among new cases had grade II and 38 % had Grade I disability). **Conclusion :** This model of reaching out to the community was cost effective. Patients living in rural districts had their leprosy diagnosed in their own communities. Practical demonstration about self care for disability prevention was rendered on the spot. Those who required admission and intervention were advised and referred to Anandaban and other appropriate hospital.

Structured Information Collection in the Evaluation of 'Rehabilitation in the Community' Programmes : Ten Lessons Learnt During Actual Evaluations

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Purpose : Earlier, we proposed two flow charts that permitted a characterisation of rehabilitation programmes and indicated the information that should be collected. We present the application of this methodology in five actual evaluations of programmes aiming at socio-economic rehabilitation of persons affected by leprosy. **Method :** We compared the information as required by the flow charts and presented in the evaluation reports asking: "Does this methodology adequately describe and reveal all relevant aspects of the rehabilitation programme?". **Results :** Use of the flow charts led to discussion between evaluators and programme staff about how each would characterise the programme; this was a valuable step in the evaluation process and provided insight to the staff into their current practices and aspirations. The rehabilitation services as such were well-described in the evaluation reports. More attention could have been given in the evaluation reports to :

- the programme environment, ▫ provider-client relationships

More or more explicit attention than required by the flow charts could be given to:

- linkages with other rehabilitation programmes and community organisations, ▫ questions of organisational capacity, ▫ systems to maintain and increase the quality of services, ▫ conditions and constraints imposed by donor organisations

In order to show their effectiveness, rehabilitation programmes need to develop simple information systems which show progress of clients towards their rehabilitation goals. Impact assessment one year after ending the intervention should include client's psychological and social status. **Conclusions :** The original theoretical framework has proven its value in evaluation practice. The flow-charts accommodate a variety of programmes and address the specific aims, contexts and developmental stages of the programmes evaluated. These lessons learnt will further improve the usefulness and practical relevance of the methodology we proposed. (*Disability & Rehabilitation*, 2007, in press) **Key Words :** Rehabilitation in the Community, Evaluation, Information systems, Leprosy.

Empowerment of PWD Through SHG

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The vision of the Project is to empower the Persons with Disability. The strategy we adopt is Self Help Groups. This study is to assess how far we could hold the PWD together whether they are able to be aware of their plight and will be able to analyze and find solutions and take their own initiative to change their situation. **Conclusion :** The PWD in the SHGs understood their plight to some extent and what has to be done to remedy that and what kind of system could be followed. However the members of the SHGs , because of their low academic standard and minimum exposure to outside world, becomes difficult to advocate and empower them and it becomes continuous process. **Key words :** empowerment of people with disability, self help groups in disability.

Steps Involved in Empowering Leprosy Affected Persons in A Leprosy Colony in India For Preventing Further Disability Through Self Care Groups

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Introduction : The purpose of the study was to determine if further disability could be prevented in leprosy colonies through self care groups by involving and empowering all members of the community; to evaluate the success of the steps involved - to determine what worked and what did not, and what lessons could be learned for future similar programmes. **Methods :** The main means of empowering those with impairment to prevent further impairment was through self care groups, attended not only by those with impairment but also by family members and the colony leaders. The volunteers also regularly visited the homes to train them in the home situation and to monitor the practice at home. **Conclusions :** The study showed that further disability; especially ulceration and its resulting mutilation could very definitely be reduced by involving all members of the leprosy colony community in the self care programme. **Key words :** Prevention of further disability, Self care groups, Community involvement, Family members, Community Volunteers, Ulcer reduction, Reduction in hospital admissions, Networking.

Why Most of The Leprosy Patients Do Not Want to Use MCR Footwear

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Nerve involvement leading to anesthesia is a cardinal feature of leprosy. One of the nerves Posterior Tibial nerve often causes plantar anesthesia and in turn results in development of plantar ulcer. In order to prevent plantar ulcer in Leprosy patients several stigmatized preventive and protective measures are practiced. Use of MCR footwear is one of the most effective methods in protecting anesthetic feet. However, leprosy patients often fail to understand the benefits of this footwear and often they are non-complaint due to some unknown reasons. Therefore, this study was designed to assess a number of 100 leprosy patients to know the probable reasons, which will be beneficial for our future guideline in preventive measure. The results will be discussed and presented in the Conference. **Key words** : reasons for not using, MCR footwear.

Sites of Ulceration in Anesthetic Feet

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Planter ulcers are major cause of mobility in patients with anesthetic feet. Apart from anesthesia other major causes of ulceration are neuropathic changes in the joints, claw toes. The majority of ulcers occur along the big toe tip, along the metatarsal heads, lateral boarder of the foot and the heel. In this study we have tried to identify the probable causes of ulceration rate of occurrence of ulceration at each site. **Key words** : ulcers sites, anesthetic foot.

Simple Self-Care Heals Common Secondary Disabilities In Leprosy

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Secondary problems like dryness and ulcers in extremities are common problems in leprosy patients with peripheral nerve damage. Generally they seek medical treatment which will not help. They get acclimatised to live with the problem for the rest of their lives. Systematic approach was implemented (March 2004) through general health system in Salem district. Daily inspection, soaking, scraping, oiling and dressing were the procedures taught. A district level team consisting of Non Medical Supervisor and a Physiotherapy Technician organised training and supervision. The team trained 1643 health workers and 1832 persons with disability. Subsequent monitoring revealed that all health workers supervised the persons with disability regularly and 85% of them were found practising self-care regularly. Ulcers over the extremities healed in 89%. Simple self-care procedures can prevent and heal secondary problems in persons with leprosy related disability. The health workers in an integrated setup were capable of implementing self-care in leprosy. **Key words** : Leprosy, disability, self-care.

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Trophic ulceration, a common complication of leprosy is disabling, distressing and demoralizing for the patients. factors such as focal hyposthesia, repeated trauma, autonomic disturbances of vessels, secondary infection and osteomyelitis have always been the major obstacles in the management. **Aim :** To evaluate the efficacy of topical phenytoin in trophic ulcers. **Materials :** 60 patients were selected who were having ulcers for more than one month and without bone involvement. Phenytoin dressing in zinc oxide cream was applied daily for 4 weeks. Parameters like reduction in surface area of ulcer and granulation tissue formation were noted. **Results :** 83.3% of patients showed reduction in size of ulcers in four weeks. Bacterial culture was positive in 75% and various organisms were grown in culture. 10% of patients who did not show improvement were all positive for gram negative organisms. Four patients developed overgrowth of granulation tissue which is considered as a complication of this treatment. **Conclusion :** Topical phenytoin IS a cheap, effective alternative dressing available for trophic ulcers in leprosy.

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Introduction : LEPRO Society started a community based leprosy project in October, 2001 with a population 369357 and the disability rate of 6.1. One of the important activities of the project is to involve community and GHS staff in POD care. Accordingly the community and GHS was prepared and the POD care is transferred. The objective of the study is to assess the adequacy of community service on the POD care. **Methodology :** The study was carried out to know the status of 1063 patients managed by 74 POD kit holders under 20 Health Resource Centers (HRCs). The years 2002 to 2004 were spent in selection of stake holders, capacity building and conducting POD care along with stake holders. During 2005, activities have been transferred to community along with 74 POD kits of self-care and dressing material. **Results :** The effectiveness of service provision in 2006 is as follows: • 254 patients (23.9%) have become self-reliant in self-care practices • Care of 221 patients (20.8%) is taken over by partners • GHS staff is taking care of 167 patients (15.7%) • HRCs are taking care of 113 patients (10.6%) • The project is taking care of 308 patients (29%) • 54 new nerve function impairments recovered **Conclusion :** • About 70% of POD care is being shouldered by the community. **Key words :** • Disability rate, POD, HRC.

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Over the last two decades Novartis CLC Association has pioneered simple field based modalities of disability prevention, care and rehabilitation. This is towards the objective of making a significant and sustainable difference in the quality of life of person affected by leprosy through their treatment, as also their physical, economic and social rehabilitation. NCLCA was among first to introduce "Improving access to MDT" in low endemic area in Gujarat and Blister Calendar Pack in Goa. It is now a recognized fact that MDT prevents deformities and through this project it was possible to decrease the quantum of deformities. Another important step in decreasing the disabilities is proper management of reactions in leprosy. The training of staff and doctors in steroid therapy helps to prevent and/or reverse impairments and thus decreasing disabilities. . The Novartis CLC Association's package of key modalities of care includes inserts providing health education to patients with insensitive limbs to prevent injury, burns and ulcers, teaching patients physiotherapy exercises and providing prefabricated splints for hand and foot deformities to help in correcting disabilities and to be used as an adjunct to pre and post operative regimen, providing grip-aids to enable people with advanced hand deformities to carry out daily tasks without assistance, empowering patients to deal with wounds and ulcers on their feet with self-care kit and a specially designed MCR footwear for preventing injuries. Reconstructive surgery helps correct visible disabilities thus increasing social acceptance while economic rehabilitation enhances self-esteem and social well being. Novartis CLC Association also provides integrated care to non-leprosy cases also with similar disabilities. This poster is the diagrammatic representation of NCLCA's pioneering work and cites the percentage of success with each modalities. Some of the modalities now form the part of DPMR and CBR program.

Age Group & Mobility of Hand Act as a Main Role in RCS (Reconstructive Surgery)

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There are various reasons for getting good results in RCS (Reconstructive Surgery). The reasons are:

☞ Mobility of hand (Fingers), ☞ Young age group, ☞ Minimum duration of Paralysis, ☞ No Secondary deformity, ☞ Client Co - Operation, ☞ Healthy & Strong tendon (Normal), ☞ Proper plastering, ☞ Proper Physio therapy But main role given to mobility & young age group other reasons also very common & compulsory. **Note :** For the study purpose only 100 Cases data has been selected those are operated two years back & living normal life. Age group divided into 3 groups : 1. 15 Years – 30 Years. 2. 31 Years – 45 Years, 3. 46 Years & above. Age group 1 out of 73 persons 61 are mobile claw hand good result is 60 persons in percentage – 82 %. Age group 2 out of 22 persons 16 are mobile claw hand good result is 14 persons in percentage – 77 %. Age group 3 out of 5 persons good result in 1 person only in percentage – 20 % Age, Group. 3 with small numbers. We can say clearly only one mobile hand. Got good result 4 stiff claw hand. Out of 4, 3 has got fair result & 1 is poor result. Compare with age group 1. 61 Mobile claw hand. Got 60 good & best result. Fair result only 13.

Details of 3 age group, result & percentage mentioned below table

Age Group	Total persons	Mobile Claw	Stiff Claw	Result			Percentage	
				Good	Fair	Poor	Good	Fair
15–30	73	61	12	60	13	-	83 %	17 %
31–45	22	16	6	17	4	1	77 %	18 %
46 & above.	5	1	4	1	3	1	20 %	60 %

Conclusion : Finally coming to the conclusion according to the above table shows clear picture no. of mobile claw hand results at the same view of age group according to the age group and mobility of the hand good result percentage is high. Stiff hand results percentage is low. Finally mobile claw hand and younger age group will get good & best result in R.C.S.

Squamous Cell Carcinoma in A Short Foot - Modified Syme's Amputation

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Posterior migration of heel and limb shortening are the major draw backs with Symes amputation. Eventually a patient starts walking on the lower end of tibia and finally ends up with a revision below knee amputation. This problem is common with patients with neuropathic ankle joints due to leprosy and diabetes. In modified Symes amputation a talus block is made and tibio-talo-calcaneal arthrodesis is done which will maintain the limb length and prevent posterior migration of the heel.

Key words: squamous cell carcinoma of foot, Syme's amputation, posterior migration of heel pad.

Screening of Deformity Cases To Estimate and Facilitate Reconstructive Surgery – A Pilot Study in Hardoi District, Uttar Pradesh, India

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Introduction : In the current scenario of leprosy, Disability Prevention and Medical Rehabilitation (DPMR) services are increasingly focused of which Reconstructive Surgery is an integral component. However, district-wise reliable data on the backlog of cases who would benefit from RCS is not easily available, while it is crucial to plan the logistics etc. **Methodology :** The District Nucleus and the Field Staff of the Government Health Infrastructure mobilized the deformed cases to the Screening Points at various PHCs. The Surgeon and Physiotherapy Technicians assessed these cases, which took 2 days in January and 2 days in April 2007. **Results :** the total no. of deformed cases as per PHC wise list were 500 cases (approx.) and the no. attended the Screening points was 350. 325 patients had motor paralysis of hands, feet & eyes and 210 cases were identified for Reconstructive Surgery. It is observed that 105 patients could be operated upon early while another 105 needs additional Physiotherapy Sessions before Surgery is contemplated. So far 40 cases were operated. The study highlights the intricacies of such an exercise.

P-259**Reverse Sural Artery Flap for Ulcers in Neuropathic Foot, Anterior Aspect of the Foot, Lateral Maleolus, Heel, Posterior Aspect of Ankle And Shaft of Tibia**

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Ulcers are common in patients with leprosy with anesthesia. We have used reverse sural artery flap in 10 patients with ulcers in the posterior aspect of the heel, lateral maleolus, anterior aspect of the ankle, to cover the tendo-Achilles insertion and the lower end of the shaft of tibia to cover the exposed tibia. Presenting the indications, intra and postoperative complications, 1 year follow up results. **Key words** : foot ulcers, osteomyelitis of tibia, reverse sural artery flap.

P-260**Compliance for Splints and MCR Footwear Provided to Leprosy Patients Registered at an Urban Leprosy Project in Mumbai**

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Several aids have been devised to prevent and correct the deformities in leprosy. Although these aids are found useful, its effectiveness largely depends on the use of these aids by the patients themselves. Several factors including stigma might contribute to poor compliance. The compliance can be improved only, if these aids are functionally beneficial and aesthetically acceptable to the patients. ALERT-INDIA has been producing appropriate physiotherapy aids at its Footwear and Splint Unit that are provided to leprosy patients. A longitudinal study was undertaken within the framework of the Leprosy Elimination Action Programme (LEAP), initiated by ALERT-INDIA to assess the compliance for hand splints and MCR footwear provided to the leprosy patients with disabilities and deformities. A survey of 200 leprosy patients, who were provided with MCR footwear or hand splints, attending the Leprosy Referral Centres in Mumbai and Navi Mumbai, was done using a structured questionnaire. The patients' perspective on the effectiveness and acceptance for splints and MCR footwear were assessed. It was observed that the patients who had better understanding and self-motivation had shown better compliance than others. Priority must be given to the assessment of activities of daily life (ADL) and motivating the patients accordingly before providing such aids. There is a need to evolve a system of monitoring and guiding the patients for greater acceptance and better compliance based on ADLs.

P-261**Plantar Soft Tissue Thickness and Skin Hardness in Leprosy Neuropathic Foot**

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Introduction and purpose of the study : Peripheral neuropathy is one of the major risk factors of foot ulcers in leprosy patients through a multifactorial pathogenetic sequence that involves motor, sensitive and autonomic components of peripheral nerve. This study aimed to quantify the changes in skin resilience and plantar padding thickness in leprosy neuropathic feet, in order to check neuropathy-associated modifications. **Methodology** : The sample consists of 15 persons affected with leprosy (mean age 45.45 years) who were suffering from posterior tibial nerve lesion. Patients underwent an evaluation of touch pressure sensation by means of Semmes Weinstein monofilament, intrinsic muscle strength by paper grip test, measurements of skin hardness by means of durometer and plantar thickness by means of lateral view radiograph of foot and ankle. Skin hardness was measured at heel, lateral border, 5th, 3rd and 1st metatarsal heads. Plantar padding thickness was measured at lower border of calcaneum, cuboid and 5th metatarsal head. Patients were compared with age and gender matched leprosy affected people without posterior tibial lesions (controls), who underwent the same evaluations in the same order. **Results** : Skin hardness was diffusely increased in all the tested site in neuropathic foot and significantly higher in heel, lateral border 3rd and 1st metatarsal heads ($p < 0.05$). plantar thickness was significantly lower in neuropathic foot ($p < 0.01$) in forefoot and mid foot. **Conclusion** : Skin hardness and loss of plantar padding strongly associated with neuropathy. **Key words**: Neuropathic foot, skin hardness, plantar thickness.

Cosmetic Appearance and Patient Satisfaction After Correction of Claw Hand in Leprosy

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Introduction : Restoration of cosmetic appearance is one of the main objectives in deformity correction in leprosy followed by patient satisfaction after Reconstructive Surgery. **Methods :** A Retrospective study was conducted at The Leprosy Mission hospital Naini to measure cosmetic changes in hand and level of patient satisfaction after Zancolli procedure. 300 hands of leprosy-affected patients were operated during 2005-2006. Lasso procedure of looping Flexor Digitorum Superficialis through proximal pulleys of the digits was done. Following a Post-op exercise regimen, joint angles were measured with hand goniometer. Level of patient satisfaction following surgery was recorded by Visual Analogue scale. Mean (SE) Angles measured for all 4 fingers. **Results :** Varying degrees of hyperextension of MCP joints was achieved, giving good cosmetic appearance and high level of satisfaction following surgery. **Key words :** claw hand surgery, Zancolli lasso procedure, patient satisfaction.

Evaluation of Palmaris Longus Lasso correction for Claw Hand

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Introduction : Palmaris Longus (PL) Lasso is the preferred surgical option for those having hyper mobile fingers and long flexor weakness. There are reports that there is adhesion formation due to anastomosis, which interferes with the movement of fingers. It was therefore proposed to make a careful evaluation of this procedure on all patients who had PL lasso correction at TLM Hospital in Naini, Allahabad district in Uttar Pradesh. **Methods :** Pre and Postoperative measurements (Unassisted angle, fist and grasp contact & power) were compared in 62 patients who underwent PL Lasso surgery during 1998 to 2006, in terms of outcomes after surgery. **Results :** Nearly 80% showed improvement in lumbrical position, with 43.5% showing marked improvement. Grasp contact showed improvement in nearly 90% of patients. Thus, almost all the patients had good lumbrical position and complete fist, which confirms the free action of transferred tendon. It is concluded that adhesion formation is not inevitable and can be prevented. **Key words :** lasso surgery, claw hand.

Long Term Impact of The Reconstructive Surgery in Leprosy at TLM Referral Hospital Shahdara

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Surgical reconstruction of the deformities in leprosy is now firmly established but has some limitations. Tendon transfer surgery is a very specialized technique demanding complete concentration and patience on the part of the surgeon as well as the patient's cooperation. A follow up study was done on all the patients who had reconstructive surgery during 2000-2003. Standard criteria were used for grading results at discharge, after three months and one year. 463 patients (372 males and 49 female) who had reconstructive surgery during Jan 2000 to Dec 2003 were followed up. The age of patients varied from 8 to 65 years with a mean age of 28.4 years. The results were consistently good at discharge and generally at the end of three months and one year after discharge. Unfortunately follow-up at three months was only 50% and at one year only 25%. Comparison of responders with non- responders showed that the patients from long distances generally dropped out of follow up. During hospitalization and particularly at discharge, patients must be encouraged, motivated to report periodically for post operative care. Addresses must be correctly recorded by the MRD and updated. Patients' should be made responsible for their treatment and outcomes. Some strategy should be developed to contact non-responders. **Key words :** reconstructive surgery, long term impact.

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Introduction : Some of the disabilities in leprosy are corrected to restore the lost form and function through reconstructive surgery (RCS) to prevent de-habilitation. LEpra Society pioneered RCS facilities since 1994 in a vertical set up and by 2006 a total of 2705 surgeries have been performed on the patients of its projects. This paper analyzes the pattern of deformities corrected and frequency of various disabilities needing surgery. **Methodology :** LEpra Society started anti-leprosy activities in Orissa in 1990 and its projects have rendered MDT, POD and SER services. In the process, Society has financially supported a RCS unit and the suitable cases were referred by projects to the centre. It followed a sound protocol of pre operative physio care, surgery and post operative management including follow-up. Results Among the total 2705 surgeries, 2079 surgeries were availed by males (76.9%) and the rest 626 (23.1%) by female. This included 47 male and 38 female children. Out of 2705 disability corrections, 1206 (44.6%) were for ulnar clawing, 681 (25.2%) for foot drop, 244 (9%) for thumb opposition, 143 (5.3%) for lagophthalmos, 15 (0.6%) for extension of wrist/fingers, 366 (13.5%) others which include nerve decompressions, minor procedures and secondary deformity corrections. Upper limbs were affected more with 1833 cases (67.8%) followed by 723 (26.7%) in lower limbs and 144 (5.5%) in eyes. **Conclusions :** The commonest correction is ulnar claw About 90% surgeries were performed to correct the primary disability. **Key words :** Disability, RCS, De-habilitation, Physiotherapy.

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Twenty five cases of planter defects were studied for the presence of bone changes in feet. Majority of the patients were in the 30-50 years of age group. It revealed different specific, non-specific and osteoporotic bone changes. Specific bone changes were usually destructive because of underlying disease. Non specific bone changes were absorptive in nature because of anaesthesia, ulceration and non specific infections of extremities. Osteoporosis was noted in the extremities. Present study reports our experience in study of Bony architecture in plantar defects. In this study radiological bone changes have been studied in 25 patients who presented with planter ulcerations. The most common cause of this ulceration was leprosy. Our findings suggest that commonest non-specific bone changes were absorption of phalanx, concentric absorption, linear calcification and less common changes like osteitis or osteomyelitis and the least common changes were cupping of joints and acute osteitis. It is our endeavour to put forward a reminder that while self-care is promoted to prevent or cure ulcers, if underlying bony changes are not kept in mind less than satisfactory outcome may be obtained. Referral of all cases who do not heal within certain period is mandatory for evaluation with skiagram followed by proper orthopaedic management.

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Introduction : SALSA and Participation Scales are relatively novel means of assessing patients with disabilities. Their use to evaluate chronically disabled, asylated ex-patients of leprosy can be useful in several aspects. The assessment of management efficacy can be one of the applications of such scales. In this work, patients of the Casa de Saúde Santa Fé, Três Corações, MG, Brasil, an ex-colony of leprosy, have been evaluated in such a way. **Methodology :** 40 patients (20 male, 20 female), all asylated, all above 50 years of age, with advanced degrees of physical disabilities, were evaluated using SALSA and Participation Scale methods. The results have been tabulated and analysed. **Preliminary results :** The scales were reliable and easy to use in this context. Initial results have been obtained and will be compared to future others, after management strategies can be changed, as oriented by present results. **Conclusions :** SALSA and Participation Scales can be useful in the evaluation of asylated, chronically disabled ex-leprosy patients. **Keywords :** Leprosy. Disabilities. SALSA. Participation Scale.

Integrating Patients with Leprosy Deformities into a General Rehabilitation Facility

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Introduction : A new Physical Rehabilitation Center was opened (March 2006) at the Casa de Saúde Santa Fé, an ex-colony of leprosy in Três Corações, MG, Brazil. This facility was originally intended to function as a general rehabilitation service, without any emphasis on a given disease. Yet, due to its existence inside an ex-colony, but also as a consequence of a new policy of the MG State Health Secretariat, patients with leprosy deformities have been integrated into this Center, changing its focus. In this work, the first year of such an experience is described. **Methodology :** Patients with deformities and disabilities due to leprosy, under treatment at the above-named facility, were interviewed as to their opinions; their prontuaries were reviewed; aspects related to prejudices and integration were investigated. **Result :** There was a uniform favorable opinion pertaining the integration in all its aspects. **Conclusions :** Integration of ex-leprosy patients with disabilities and deformities into a general physical rehabilitation facility has been a worthy experience, deserving continuation. **Keywords :** Leprosy. Rehabilitation centers. Prejudice.

Analysis of Participation Scale of Leprosy Affected Persons of Nepal

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Leprosy is a chronic disease which leads lots of complication. One of most harmful complication is disability and deformity which leads social stigma in the community. One of main aim of this study is to find out participation status of the leprosy affected person in the society. This study also helps to find out role of disability for active participation in the social activities. About 50 leprosy affected person with visible disability will be in roll in this study. Participation scale questionnaire are using for data collection. Data will be taken with direct interview with patient. Finding data's will be analyzed with using Microsoft Excel computer programme. **Key words :** participation scale in leprosy.

Rehabilitation of Leprosy Patients Yesterday, Today ,Tomorrow

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Introduction : Deformities and disabilities in Leprosy are challenges not only to the patients but also to the treating team. Deformed patients need continuous care after cure. The Social Welfare Department of Sacred Heart Leprosy Centre, Sakkottai, South India had implemented various Rehabilitation Programmes with financial assistance by EMMAUS-Switzerland, GLRA, IDEA-India and support of government organisations. A study was undertaken to assess the rehabilitation measures, to analyse the effectiveness in the approach in various periods. **Methods :** Patients with deformities which interfere with normal life were assessed, assistance were given after evaluation. **Results :** Activities from 1980 to 2006 were analysed. No. of beneficiaries House visit/Camps conducted: 8141 Economical Rehabilitation: 605 Vocational training: 179 (after 1998) Education Assistance : 178 Aids and appliances : 8237 (Central Government Scheme) Average of Rs.2,95,815 was spent for rehabilitation per year. Discussion: It was observed that financial assistance in the past was replaced by giving occupational/training and partial support for education. As of today 70 science/arts graduates, 7 teachers, 30 nurses, law, medical, veterinary, BPT graduates, 52 engineers, IIT, I.T. and others were benefited through education scheme. The beneficiaries were mainly wards of leprosy patients. **Conclusion :** The disabled need care, help and support. Training and education assistance have yielded good result. This has to be further extended in future. **Key Words :** Rehabilitation, Vocational training, Education Assistance.

To Compare the Effectiveness of Velcro/Buckle Straps vs Elastic Straps in Microcellular Rubber Footwear for Severely Deformed Leprosy Hands

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Introduction : This study was aimed at finding out the best Micro Cellular Rubber footwear strap for leprosy affected subjects with severely deformed hands and To enhance the compliance of using Micro Cellular Rubber footwear at all times independently.

Methods : Then Elastic strap Micro Cellular Rubber footwear was introduced to the subjects and given training to use the footwear for two days, later on timing of Donning and Doffing for Elastic strap was recorded. **Results :** This study showed the time required for donning & doffing of conventional Velcro/Buckle Micro Cellular Rubber footwear were more compared with Elastic strap. The Elastic strap has significantly reduced the time duration in donning & doffing of Micro Cellular Rubber footwear. Hence it will enhance the compliance of using Micro Cellular Rubber footwear. **Conclusion :** The above results proved that elastic strap saves time in donning & doffing and also will enhance the compliance of using Micro Cellular Rubber footwear for regular use and there by reducing the recurrence of plantar ulcers and improve the quality of life. **Key words :** housing, stigma reduction.

Leprosy Colonies in Bihar

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There are forty-five Leprosy colonies in Bihar . 1. In Gaya which is about 110km from Patna has three leprosy colonies. In these three colonies there are altogether about 700 people living in these colonies with their families and children. Each leprosy-affected people has his own pucca house on his own land. There are facilities of water and electricity. There is a government leprosy hospital beside these leprosy colonies from where all the leprosy affected people get medicine. There is provision for children's education and some of them are studying in boarding schools. Old age Pension and Social Securities Pension is available to all the affected ones. About 200km away from Patna there is East and West Champaran where we have Chakiya Leprosy Colony, Pipra Leprosy Colony, Gandhi Leprosy Colony (Kumarbagh). In these leprosy colonies there is water facility but there is no electricity connection, none of them have pucca house. They live in huts made of straw and grass. They do not have their own land. Everyone gets old age pension. In Bargania and Chainpur Leprosy Colonies there is no electricity, no land of their own and none are getting old age Pension. They have drinking water facility. Dhaka Leprosy Colony in East Champaran has pucca houses, electricity, solar lights, water and everyone is getting old age pension. In Ramgarhwa Leprosy Colony there is electricity, water and old age pension scheme. For children's education there is a school in the leprosy colony itself. The houses are quite old and water leaks through the roof during rain. Ghora Sahan Leprosy Colony has pucca houses but need urgent repair. There is water and everyone gets the old age pension. There is no ration card. Chauradanu Leprosy Colony has pucca houses but need urgent repair. Forty people get pension and rest are not. Janki Leprosy Colony in Sitamarhi has pucca houses, electricity, water, school for children and all get old age pension. But the houses are old and they need urgent repair. Laxman Nagar Leprosy Colony in Sitamarhi has pucca houses but need urgent repair. There is electricity and water and old age pension scheme. Bhairon Ganj and Chanpatia Leprosy Colony have pucca houses but need urgent repair. There is a primary school in Chanpatia Leprosy Colony. None of them get old age pension. They have their own land. Arrah Leprosy Colony in Bhojpur district does not have their own land. This colony has huts. There are three hand pumps, ration cards and old age pension. 250 leprosy-affected people live here. Motipur Leprosy Colony has pucca houses, own land, old age pension, water, school for children but no electricity connection. About a little distance away from Patna there are two leprosy colonies in Khagaul- Ram Nagar and Prem Nagar Leprosy Colonies they have water facilities, electricity, old age pension, ration cards, a non-functional school. Children go outside to study. Very long time back a pucca school was built in Ram Nagar Leprosy Colony in which I taught to the children of leprosy affected people for 22 (twenty two) years, now which is non-functional due to scarcity of fund. We are trying to re-open it and your kind help is needed. Leprosy affected people of Bihar do not get any help from any organization. I have visited all the 45 (forty-five) leprosy colonies of Bihar and got them made ration card, old age pension, red cards and in many got installed hand pumps for drinking water. I do not get any help to visit these leprosy colonies. Frequently I keep visiting the S.D.Os, D.Ms and Chief Minister. About 20 colonies in Bihar need urgent repair work. We would like that each leprosy colonies of Bihar should have vocational training centers, good education facilities for children employment for their unaffected family members and cease of begging.

Nerve Function Evaluation After Nerve Decompression Surgery in Leprosy Affected People

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It is important to realize that leprosy nerve damage could occur before diagnosis, during and after MDT treatment. Recent nerve damage can usually be reversed by steroids. However, in many cases, no further recovery can be expected mainly when the damage occurred long ago. Nerve decompression is one of the intervention which can be done with the aim to minimize any adverse effects and to prevent any worsening of the neural damage. Among 813 leprosy cases detected in 2006 in the Amazonas State, Brazil, 96,8% were accessed to the degree of disability and found that 17,1% presented degree I and 7,4% degree II of disability. The objective of this study is analyze, using the neurofunctional exam, the effectiveness of nerve decompression surgery in leprosy affected people. From March 2006 to September 2007, were performed 206 nerve decompression surgeries. In the post-operative follow-up, the pain told as the main complain and also a disability factor, presented important improvement promoting satisfaction mentioned by the patients about the results, as well as improvement of sensibility; less improvement in nerve motor function was observed. **Key-Words** : Leprosy, Nerve Decompression Surgery, Neuritis.

Impact of MDT on Leprosy Neuropathy

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Leprosy remains a public health problem because nerve damage is permanent and difficult to prevent. It is necessary to determine the reliability of different techniques that measure the function of the various nerve fibers to evaluate early appearance of neuropathy. A prospective clinical study was performed in 24 randomly selected patients, 11 paucibacillary (PB) and 13 multibacillary (MB) that were evaluated before and 1 year after MDT. Peripheral nerve function was evaluated clinically, and by means of the sympathetic skin response, skin vasomotor reflex, and electroneuromyography. At the moment of diagnosis, all patients had some nerve function alteration except for one PB patient. At the final evaluation all MB patients remained with altered nerve function and 63% of the PB patients recovered clinical nerve function although nerve conduction alteration persisted. Half of the patients recovered autonomic function regardless treatment group. Clinical and neurophysiological testing in PB and MB patients behaved differently, MB showed more involvement of larger fibers than PB patients. MDT treats leprosy infection but is insufficient for arresting or preventing the nerve damage responsible for impairment and disabilities in predominantly MB patients. **Keywords** : neuropathy, MDT, electroneuromyography, skin vasomotor reflex, skin sympathetic reflex.

The Paper Grip test for Assessing Intrinsic Muscle Function in the Foot

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Apart from loss of protective sensation at skin and joint level, and the proper functioning of the autonomic nerve system, loss of motor balance in the lower extremity may be one of the key factors causing unwanted peak pressures in the plantar area which may lead to ulceration and osteomyelitis. The Paper Grip Test is a simple and proven method for the early detection of intrinsic muscle weakness in the foot, which may help in the prevention of forefoot damage, especially in those cases where the sensation in the forefoot is not affected.

The Impact of Physical Therapy Through Satellite Clinics

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Intervening surgically and therapeutically to rehabilitate or to maximize the functional ability of the Person with Disability (PWD) is always the felt need of the Persons with Disability and his/her family members. The IDC & CBR (Integrated Disability Care for the Disabled and the Community Based Rehabilitation) Project strives to fulfill this need. Since this project is called Integrated Disability Care, this concept fits well into the vision and Mission of the Project. CBR aims to provide the service delivery to the door step of the PWD. This paper aims how far we could achieve the functional ability by providing therapeutic intervention. The primary aim of the Satellite Clinic is to increase the functional ability of the PWD/CWD. The therapists through their planned visits help them to improve their functional ability. The difficulty is in motivating the parents to come to the Clinic regularly. However, this programme is vital in the community based project like this, to further enhance the functioning ability of the CWD/PWD. **Key words** : physical therapy in disability, impact of physical therapy, satellite clinics in disability.

Delayed Access of Hospital Services by Leprosy Patients with Ulcers in the District of Sivagangai Tamil Nadu

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Introduction : Ulceration of the foot in leprosy is a common problem that can be prevented by proper application of health care education and thorough self care. Despite several national programs ulcers continue to be a cause for stigma and repeat visits to the hospital. **Methods** : All patients who were hospitalized for the first time with planter ulcers were included. Their treatment needs were studied along with purpose for the visit and the ulcer characteristics. **Results** : out of the total of 120 contacts, 45 patients had visited for the 6th time. The number showed a decline from time of first ulcer till their last contact. The number of hospitalizations reduced from the first ulcer to subsequent ones with both genders being equally affected. **Conclusion** : This study demonstrates that in spite of a declining trend in new ulcers over time, there is a definite need for referral hospital service exclusively for leprosy patients. 90% of the inpatients at the time of learning contact with the hospital had persisting ulcers. **Key words** : ulcers, leprosy, access to healthcare.

Causes of Recurring Ulcers as Per Patients' Opinion

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Many leprosy patients get admitted in our hospital. But out of these admitted patients 70% complain of ulcers. Among these patients 30% patients come 2-3 times for admission in a year. This causes problem for their admission in the wards. So this study is to know the reasons why they come repeatedly. Patients are admitted more than once to be asked question There may be many reasons for this readmission but we have to know the reasons as stated by patients themselves. Therefore an unstructured questionnaire is made and translated into local language. The nursing staffs are given the questions to ask the patients. This was done with 100 patients among ward patients in our hospital. The results will be discussed and presented in the conference. **Key words**: recurrent ulcer in leprosy, causes of recurrence

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Introduction : Leprosy in children, particularly with disability is a life long suffering and stigma. Hence early detection and proper treatment & care are most important in the children. **Aims :** To study the disability in the children due to leprosy from 2001 to 2005. **Methods :** Reports & records of 9 districts, Discussion with DLO/MO of the implemented districts, Master register Interview of patients as well as families **Findings :** The trend of child disability is increasing. This is the danger sign of the program. Findings and study will be presented

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Objective : 1. To obtain sustainability of self care practice among leprosy patients. 2. To prevent further deterioration of their disability and deformity. 3. To promote self care in leprosy patients for care of their insensitive limbs. **Methodology :** 1. Admitting the grade I and grade II disability patients in the mix group residential camp (patients + treatment provider + Community). For seven days. 2. Practical training Hydro-olio-physio-exercise and education, precautions and conventional methods for care of limbs uses of protective foot wears, including education counseling performed by skill staff and trained to all patients twice in a day for continue 7 days. 3. Self care training to the patients in group and giving personnel attention to individual in specific case. **Observation :** It has been observed that the self care training in such camps is more fruitful in comparison to individual patient's health education; patient feels their needs of self care and after the camp patient continues self care for long duration. Ulcer healing and disability prevention is by product of these camps. **Result :** Regularity of self care practice at home increased comparatively individually educated patients. Non recurrence of ulcer sustainability traced and managed with the procedure. That can be maintained for a long time. **Conclusion :** IN the integration of leprosy services in general health system, these types of camps can be very useful for helping those patients who are suffering with insensitivity of limbs.

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With concerted efforts in diagnosis and treatment with MDT and the subsequent declaration of elimination of leprosy as a public health problem, focus has now shifted to the prevention of disability and rehabilitation. However, planners and policy makers are constrained by lack of field-based data on the epidemiology of disability due to leprosy. Most of the information available is hospital-based data. This paper analyzes data on disabilities that was systematically collected from Gudiyatham Taluk over 50 years. It gives information on the grades of impairment at the time of diagnosis over a 50 years period, and the present magnitude of the problem. Information of the occurrence of Gr. 1 impairment would provide valuable information to planners to develop appropriate strategies. Over a 30-year period (1965-1995), the Gr. 1 impairment among new cases remains almost steady at 10 %, while the Gr. 2 impairment shows a gradual decline from 36 % to 7.4 % in 1981. There was a further drop till integration after which the Gr. 2 impairment rises. Epidemiological and demographic data will be reported.

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Introduction : KORALEP a LEPRA Society project is working in Orissa since 1991 covering Koraput and Malkanagiri districts having 16,84,835 population. Most foot disorders are due to damage of peripheral nerves. These are complex in their aetiology and pathology and involve both the skeletal components and the surrounding soft tissues of the foot. This paper aims to analyze the pattern of foot involvement due to leprosy in the project. **Methodology :** All the cases with foot disabilities were assessed by Physiotherapist and the findings were recorded in POD/POWD format. Accordingly, required treatment and interventions were provided at patient's doorstep, disability care clinics and indoor care unit. Teaching & practicing self-care, use of adoptive devices like MCR footwear, joint care and RCS are some of the interventions followed in the process. In course of time, a considerable amount of skill and self-care have been transferred and are being undertaken by the beneficiaries themselves. **Results :** A total of 17,747 persons were cured from leprosy in the project. Of them, 1544 persons (8.7%) have disabilities at the time of registration. A total of 489 (31.7%) were Gr. I and 1055 (68.3%) were Gr. II. Among the 1544, 755 persons (48.9%) had disabilities in their feet. Of the 755 disabilities, 524 (69.4%) were male and 231 (30.6%) were female. 225 persons (29.8%) had anaesthesia and the remaining 530 (70.2%) had visible deformities. Ulcer foot was found in 408 (54%) cases. Among them, 266 (65.2%) were male and 142 (34.8%) were female. Of the total 755 disabilities, Posterior Tibial nerve was the cause for impairments in 639 persons (84.6%) with male and female ratio 66.8 and 33.2% respectively. Conclusion 8.7% of all leprosy cases had disabilities Foot disability constituted 48.9% with ulcers in 54% of cases Gr. II disability is as high as 70% Posterior tibial nerve damage is more common though foot drop draws more attention Every problem showed male preponderance. **Key word :** MCR, RCS, Anaesthesia, Disability, Impairment.

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It is well known that religious and faith based organizations have necessary ingredients to carry out self-less services. The Leprosy Mission is an admiring example. Similarly, it was our endeavor to support other NGOs, particularly Sri Ramakrishna Math, Chennai. The unique experience of conducting the "Care Camp" activity for ex-leprosy cases is the basis of this report. In the care camps held at Sri Ramakrishna Math, the activities ranged from offering the rehabilitation articles to teaching of self-care. Twenty years of involvement in rehabilitating the Leprosy Afflicted Persons (LAPs) made the task easy as they were already prevented from de-habilitation which enabled them to accept our guidance regarding self-care. Many of the patients themselves healed their wounds with "self-care kit" given by NCLCA. The follow up camps have seen the motivation of retired leprosy staff presenting as volunteers to visit their home and identify their problems, thus beginning the community based rehabilitation services. The self-care practices of LAPs were assessed periodically. Train the Trainers program included the leprosy workers & the volunteers. It has resulted in getting more cases from the adjacent area. The efforts are on to adopt a neglected area for "Care & Cure" activity. The poster depicts the activities and enumerates benefits to help other NGOs to think in direction of caring and community based rehabilitation.

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Introduction : Prevention of impairment and deformity is the most priority area in the post-elimination scenario. Though the introduction of MDT has resulted into drastic case reduction and deformity rate, yet the existing no of deformed / disabled persons and deformity among new cases are not negligible. The social implication of deformity in multifarious, the degree of stigma and ostracisation depends on the degree of deformities. Apart from aestheticism and self stigmatization, individual productivity is diminished. Hence, prevention and correction of deformities and reinstatement of productivity should be the aim of this venture. Community, patient and patient's family member's education, practice of self-care and surgical interventions are the essence of a meaningful POID program as revealed through a 10 year's (1997-2006) retrospective study of the activities of Gandhi Memorial Leprosy Foundation, Balarampur unit in Purulia district of West Bengal. **Method :** The educational intervention were designed emphasizing early case detection and preventive aspects of disability for the community and education of patients and patient's family members with self-care demonstration and conducted accordingly in the operational area. Regular follow up was undertaken with special attention to G2 and post operative cases. The health workers were trained for two days before implementation. Patient's family members were involved actively in the process. **Result :** During 10 year's period (1997-2006), total 4964 new cases were detected. Deformed cases among new detection were 322(G1-291 G2-31). However, total cases under POID care were 957(G1-306 G2-651) including old cases. Out of them 726 were improved, 190 remained static without further aggravation and condition of 41 were worsened due to migration and non-compliance. **Conclusion :** Appropriately designed communication, methods of approach, self-care demonstration, enhanced motivation and practice by the clients, regular follow up and surgical intervention are the essential components of a committed POID program.

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Over the years many leprosy claw hands suffer from the problem of stiffness of the PIP joints of fingers. Its correction has remained an enigma to reconstructive surgeons; nonetheless it is important for enabling the hand for the activity of daily living. The various methods of correction consists of POP cylindrical casts, dynamic gutter splints, vigorous stretching exercises and distraction through "K wires" inserted in the phalanx proximally and distally. Distraction technique derived from Ilizarov's pioneering work in limb lengthening now is a standard arsenal in the armamentarium of surgeons. However, caution should be exercised at times. However, preoperative and postoperative splintage and physiotherapy exercises are mandatory to avoid recurrence or limitation in the range of the movement of PIP joint. With good patient's compliance, it can be concluded that biological structures are stretchable and if the limiting factors are dealt with properly surgically, the results could improve further. This poster presents simple technique and results of the procedure carried out by us in few hands.

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Introduction : Immobilization of the foot and ankle after Tibialis Posterior transfer (TPT) for paralytic foot drop correction for four weeks is the usual practice. The purpose of this study is to develop a protocol for early postoperative active mobilization (EPAM) for TPT and compare the results with post-operative immobilization of the transfer. **Methodology :** In a prospective study, 23 foot drop corrections with TPT had undergone EPAM from fifth postoperative day. Each foot was assessed and given therapy pre- and post-operatively followed by regular follow-ups. Primary outcomes are 'foot at rest' position, 'active dorsiflexion', 'total active motion'. The results of EPAM were compared with retrospective cohort of similar transfer operated prior to the EPAM trial and immobilized in a cast for 4 weeks. Statistical analysis was done by student test. **Results :** There is no incidence of tendon transfer insertion pull out. There was no significant difference in active dorsiflexion, foot at rest and total arc of motion between both the groups. Weight-bearing began 17 days earlier with early postoperative active mobilization of tibialis posterior transfer. **Conclusions :** The study concluded that EPAM produces similar outcomes to immobilization of the transfer. The reduced morbidity and earlier weight-bearing is an added advantage to the patient. **Keywords :** Foot drop, tendon transfer, early active mobilization.

A Comparative Study Between Immediate Active Mobilization and Immobilization for Claw Correction

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Purpose : To test the hypothesis that immediate post-operative active mobilization (IPAM) of the hand following claw correction with Flexor Digitorum Sublimus of middle finger 4 tail pulley insertion (FDSM-4TP) will achieve similar outcomes to the standard practice of immobilization in a cast. **Methods :** In a prospective study, 32 hands with complete ulnar nerve paralysis had 4 digit claw deformity correction and IAPM at 48 hours. Outcomes are the status of tendon transfer attachment to the flexor pulley, and the results of the claw deformity correction. The results from both groups were compared by Mann-Whitney U test. **Results :** There was no incidence of tendon transfer pullout during IPAM of FDSM-4TP. There was no difference in both groups in the early outcome of deformity correction but significant difference at late follow-up. There was significant difference in ability to maintain the intrinsic plus position of digits in the early & late follow-up. The rehabilitation time was reduced by an average of 21 days with IPAM. **Conclusions :** This study supports the hypothesis and suggests that better outcomes can be achieved in reduced time making IPAM following FDSM-4TP the preferred postoperative therapy protocol for claw deformity correction. Earlier return to ADL was a further benefit to the patient. **Key words :** claw hand, ulnar paralysis, tendon transfer, early mobilization.

Orthopaedic Department of Mkg Medical College, Berhampur Takes Up Re-Constructive Surgery (RCS)

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Introduction : Leprosy often results in disabilities leading to limitation of day to day activities and loss of livelihood. To correct these deformities, re-constructive surgery (RCS) is undertaken at the Orthopaedic department of MKCG Medical College, Berhampur, Orissa, supported by LEPRA Society. This paper presents the activity held at the college from November, 2006 to August, 2007. **Methodology :** The cases with deformities were referred from peripheral health institutions to the college, screened at OPD and admitted as per the suitability. They were under pre operative physio management and then recommended for surgery soon after fitness. Post operative re-education was given for 4 weeks after 3 to 4 weeks of immobilization. The cases were advised for self-care at home and regular follow-up at the institution as per the schedule. **Results :** During the period, 30 surgeries were conducted. Of them 18 (60%) were male and 12 (40%) were female. The beneficiaries were between the age group 13 – 42. Of the 30 surgeries, 18 (60%) had correction of ulnar claw, 7 (23.4%) foot drop, 3 (10%) median paralysed thumb, 1 (3.3%) lagophthalmos and 1 (3.3%) wrist drop. **Conclusion :** Ulnar claw is the commonest correction in leprosy RCS could be conducted successfully under public-private partnership in a medical college. **Key words :** Deformity, Rehabilitation, Re-education, Immobilization.

Operation TRAC – for Improved Grasp, Pinch and Cupping Action

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Operation TRAC – for improved grasp, pinch and cupping action In general claw hand correction by any technique does not attempt to correct the transverse arch of the hand. The correct actions of grasp and cupping need protraction and retraction movements at the metacarpophalangeal joints of the ring and little fingers. While author's lasso technique corrects the transverse arch it does so on account of the fact that division of FDS in to four slips is carried out at the center of the palm under vision. Despite that hypothenar movement is lacking. Provision of extra slip to be inserted at the abductor digiti minimi insertion greatly facilitates the protraction pull required to correct the transverse arch. This poster presents the technique and results in improvement of the dynamic actions of grasp and cupping. It shows that holding a cricket ball, supporting a spherical object, dynamic grasp for holding a rope or machine handle and even eating rice with hands improve much better with the operation TRAC.

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Introduction KORALEP of LEpra Society has started anti-leprosy activities in a vertical set up in 1991 covering two tribal districts (Koraput & Malkangiri) with a population of 16,84,835. In subsequent years it took up POD/POWD activities and indoor care facility was set up in 1994 with 10 beds, increased later to 26. Since such facility is scarce in govt. sector, it has attracted many beneficiaries. This paper analyzes the utilization pattern of these facilities in managing reactions, neuritis/NFI, ulcer till December, 2006. **Methodology** A Medical Officer is in-charge of the unit, supported by a physiotherapist, ANM, laboratory technician and a shoe technician. Patients suffering with severe reactions and ulcers mostly referred to the unit by field staff like MO, PMW and NMS. Cases requiring RCS related services were also referred. Very few cases were referred by the neighbouring districts. The cases were then screened by the MO, admitted and all the required services were provided. **Results** Since the inception till December, 2006, 17,740 persons have been cured from leprosy. Of them 1544 persons (8.7%) have the disabilities (Gr.I-489, Gr.II-1055). Of these 1544, indoor care was required by 1403 persons including some repeat admissions. Of these 1403, 1096 (78.1%) are male and 307 (21.9%) are female. The facilities were mostly utilized for RCS related services with 615 cases (43.8%), the next group being 401 ulcers (28.6%). The remaining cases include patients admitted for shoes with Orthosis devices 174 (12.4%), neuritis/NFI with 121 (8.6%) and both types of lepra reactions with 91 (6.5%). **Conclusions** Health seeking behaviour is high (78.1%) in males Indoor care facilities in leprosy are mostly utilized for activities related to RCS (43.8%) and treatment of ulcer (28.6%) **Key words** Indoor care, Reaction, Neuritis/NFI, Ulcer, RCS.

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Introduction : Leprosy is one of the oldest diseases with more social than medical problems. In no other disease individuals are forced to made to leave their families and forced to live as outcastes in separate colonies or settlements. For many of the men and women affected by the disease, simply overcoming the infection is not sufficient to allow a straight forward return to their previous life-style. They need support beyond clinical that covers assistance in psychological, social and economic aspects of life. LEpra Society fully subscribed to the principles described above. It mobilized various supportive measures from different sections of the society to meet these needs. This paper deals with beneficiaries and support schemes. **Methodology :** LEpra Society started the Leprosy elimination program in the state of Orissa in the year 1990 in Sonepur District and the Socio-Economic Rehabilitation (SER) activities in the year 1997. Over the passage of time this activity got incorporated in almost all projects of the region. After several stages of assessment, LEpra Society extended direct economic support under SER apart from mobilization of support from different schemes of the Government and Philanthropists and facilitated linkages. **Results :** By the end of December 2006, SER support has been provided to 8017 number of leprosy cured persons through its projects. The beneficiaries are mostly linked with social security as well as income generation schemes of the Government. Of the 6247 benefited, 2489 persons (39.8%) have been linked to the pension scheme followed by 1245 persons (19.9%) linked to IAY housing scheme. **Conclusion :** Leprosy cured persons could be integrated in the society and lead dignified life with SER support SER goes a long way in stigma reduction. **Key words :** Psychological, Community, SER, Philanthropists.

Economic Rehabilitation Through Income Generation Aids – A Sustainable Community Based Rehabilitation Activity

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A person affected by leprosy often shows the physical and behavioral changes. Development of disabilities / deformities makes these changes worse. As such majority of leprosy patients stay in abject poverty. Thus, not only the person but also the family has to bear the consequences. Rehabilitation, preferably community based, is one of the solutions to bring these unfortunate individuals to mainstream society. Economic rehabilitation with gift of income generation articles has been established by NCLCA as one such activity which not only brings about changes in the affected person but also benefits the entire family. Economic assistance assumes more significance for those challenged with activity limitations on account of physical deformities as well as for those who have been cured of deformities with reconstructive surgery. Reconstructive surgery aims at functional rehabilitation and needs to be followed up with suitable aids on the need assessment basis in order to reinstate him fully as useful member of the society thereby achieving social integration. This poster represent the examples of income generation articles like hand carts, sewing machines, kits for carpentry, masonry or cycle/auto repair given to patients for self employment in the hope of making them self-dependant, earn for family and feel themselves as part of the society. Long term experience has enabled the Association to formulate some of the criteria for distribution of such aids.

Retrospective Study of 1000 Newly Admitted Pts at GOURIPUR LEPROSY HOSPITAL, WB, INDIA with Their Views on Socio-Economic Rehabilitation & Social Integration

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Introduction : GOURIPUR LEPROSY HOSPITAL is situated at BANKURA WB, eastern part of INDIA having 550 indoor beds and encatchment area of south Bengal as well as adjacent part of jharkhand & orissa state. **Methodology :** newly admitted 1000 pts of 2006-07 were surveyed by simple questionnaire regarding age, sex, residence, family structure including any H/O contact educational & economical status, cause of admission, deformity status, there views & experience regarding treatment facility as well as acceptance at general health care delivery system in post-integration period. Their views in rehabilitation at society were also considered. **Result :** details of the result will be shown. **Conclusion :** in post integration era there is need of proper socio-economic rehabilitation and social integration. **Key-words :** rehabilitation, society.

Role of 3 Tier Indian Panchayet System In Rehabilitation of Leprosy Affected Persons into the Mainstream of the Society

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Introduction : MDT has changed the face of leprosy & we are now heading towards a leprosy-free world but the work will be half-done if the existing patients are not rehabilitated with dignity with in community. Local SELF govt has powerful presence with wide acceptance in rural INDIA. moreover it has been entrusted by the central as well as state govt to implement a number of welfare scheme like PRY, INDIRA ABAS, SARBASIKSHA AVIJAAN etc., etc.. **Methodology :** A short description of 3-tier panchayet system and points where it can play role will be high lighted. Details of the result will be shown by chat & graph. **Conclusion-** local govt must be updated, should have a strong mind & will power to implement rehabilitation with in society. They can also play a pivotal role in economic rehabilitation by helping to include leprosy affected persons in SHG's (SELF-HELP GPOUP). **Key-words :** 3 Tier Indian Panchayet System, Rehabilitation, Self- Help Group.

P-295**Self Help Group An Integrated Approach For Socio-Economic Development of People With Affected by Leprosy and Disability**

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After the implementation of the State wide SHG Project Chhattisgarh from October 2005 there is a significant change in the life of the people. **Objective :** This study was designed to study the changes in active participation, accessibility to services, and the impact on the lives of leprosy affected after the implementation of the State wide SHG Project Chhattisgarh and other disabled in the community. **Methodology :** 500 beneficiaries were interviewed randomly, by a well designed schedule in Hindi by qualified social workers. Apart from interview with beneficiary, the secondary data and case studies were also studied. 8 districts of Chhattisgarh (Raipur, Bilaspur, Dhamtari, Raigarh, Janjgir Champa, Rajnandgaon, Durg, Mahasamund). **Results :** At the end of the study, the conclusions regarding the following changes were derived- in the attitude of the people, in economic condition, social participation, attitude of the community towards the Leprosy affected and disabled, change in accessibility/ and utilization of services and resources available in the community, impact on the lives of people how do they over come the challenges.

P-296**Measurement of Activity Limitation in Leprosy Disabled Persons Using SALSA**

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Introduction : SALSA scale is in use for assessing subjects with disabilities. Assessing Leprosy clients with disabilities can be useful in the management and evaluation of prevention of worsening disabilities (POWD). **Methodology :** 53 treated Leprosy from a colony consisting of 532 people living with 135 treated leprosy subjects were selected randomly for SALSA assessment. **Results :** The SALSA scores of these 53 subjects along with visual activity muscle strength loss of feeling on Eyes, Hands and Feet, wound count and EHF grades as per WHO will be presented in the paper. **Key Words :** Leprosy, SALSA, Disability, EHF

P-297**Assessment of Participatory Restriction and Stigma in Leprosy Affected Subjects Using Participation Scale (P. Scale)**

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Introduction : Participation scale developed by participation scale development team is used for assessing the severity of rehabilitation needs of pupils with disability with stigmatise conditions. Leprosy being one of stigmatise conditions, the use of participation scale in the group will throw light on the existing situation. **Methodology :** A Random sample of patients selected from a colony of 532 pupils living 135 treated leprosy patients were selected from Hyderabad, Andhra Pradesh, India for the study. The P. Scale format was translated to local language and administrated for the study group. **Results :** The P. Scale scores are enlisted for the total as well as items wise and results will be presented. The results will also be correlated with the EHF disability data. **Key Words :** P.Scale, Leprosy, Rehabilitation, Social stigma EHF.

Case study to Ascertain the Possibility of Undergoing Reconstructive Surgery for Leprosy Patients While on MDT But with Negative Bacterial index

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Introduction : Since nowhere has it been experimented whether doing reconstructive surgery for the leprosy patients those who are under treatment (MDT), we did the same to find out whether the surgery has any negative impacts or any related problems, so that we can encourage RCS for those while on MDT with limitations. **Methodology :** 7 patients who had undergone RCS while on MDT and were followed up to find out whether any complications occurred or not, for 6 months from the date of RCS.

Summary : The objective of the study is to find out the possibility of undergoing reconstructive surgery for leprosy patients while on MDT but with negative bacterial index. A case study of 7 patients who were explained about the purpose of the study, enrolled and undergone RCS were followed for 6 months after RCS to find whether any negative impacts such as post operative infection, reaction and neuritis etc., occurred within that given duration. **Findings :** Among those 7 patients, 1 was found with neuritis in 5th month after RCS and the others did not have any neuritis or reaction and none of them had post operative infection.

Key words : Reconstructive surgery, negative bacterial index.

Quality OIF Life After Reconstructive Surgery

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Introduction : Physical impairment has been a problem in leprosy patients in spite of regular treatment, and this raises the level of stigma in society towards them. In this study, an attempt was made to study the impact of reconstructive surgery on the patients' quality of life and to ascertain reasons for any dissatisfaction with the procedures. **Methods :** all patients who underwent reconstructive surgery in the last 5 years were questioned in detail about satisfaction, changes in lifestyle and self esteem and in functional ability. **Results :** Family and community acceptance was 80-100%. The quality of life after various surgeries differed. Improvement was seen in 72% after foot surgery, in 100% after eye surgery and 69% after hand surgery. Reasons for dissatisfaction included lack of change in physical appearance or that improvement in function fell short of expectations.

Conclusion : Most of the patients expressed their feelings about feeling free to intermingle with society after their surgery.

Key words : reconstructive surgery, quality of life.

Changing the Image of Leprosy in Chhattisgarh State of India

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The familiar image of leprosy is deformity leading to eventual destitution and further social and economic hardships. Recently stigma reduction intervention trials have been started at Chhattisgarh in which the baseline survey has confirmed that one of the main reasons for stigma is deformity. MDT has been a wonder drug and has already cured more than 13 million people in the world. Prompt and regular treatment with MDT for 6 months for PB and 12 months for MB cases cure leprosy if patients come early enough before any residual disabilities set in. There are also many wonder drugs for management of reactions and neuritis viz. corticosteroids, Thalidomide, Azathioprine, chloroquine etc. These drugs are now available at most PHCs under the integration and also offered free of cost. The main challenge then, is to motivate patients to report as early as possible to get treated promptly. This requires the active collaboration with communities, the families of patients and patients themselves. During 2006, hospital records of TLM Champa, shows 185 cases (never treated before) were registered for anti leprosy treatment out of which 68.6% are MB. The level of Grade II deformity has come down to 17% among new leprosy cases, which shows that we still have a long way to go towards control of this disease. **Key words :** community based approaches, reduction of stigma.

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Introduction : Information Education & Communication commonly abbreviated, as IEC is an integral part of leprosy control program. To facilitate this program, several audio-visual aids are produced. Many of them may not have been properly field tested for better reach and greater impact. Without such scientific assessment prior to dissemination, the outcomes may result in poor effectiveness and wastage of scarce resources. Such an evaluation must be done scientifically with proper methodology.

Methods : In this paper, findings from a study testing selected IEC materials (posters, pamphlets, booklets, docudramas and spots) were tested. Four target groups (children, leaders, women and men) were used in three states of India. Effectiveness of the aid in terms of message clarity as well as on visual appeal, language, characters used if any, comprehension, reaction/opinion to the format used etc were determined. **Conclusions :** Research is imperative in production of effective IEC materials. **Key words:** audiovisual aids, IEC material, field testing.

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Objectives : Under the National Health Policy, Government of India achieved the goal of elimination of Leprosy as a public health problem in the month of March 2006 when the recorded prevalence rate (PR) came down to 0.84/10,000 population. There still remain a considerable number of cured leprosy cases with partial or complete claw hand deformities. Claw Hand deformities are commonly seen in Leprosy patients, which become more apparent when the patient opens out the fingers fully. They require medical and psychological rehabilitation to improve their quality of living. **Methods :** So far the Department of Rehabilitation Medicine, Patna Medical College, India currently under the "Leprosy Reconstructive Surgery and Rehabilitation Program" admitted 130 cases, referred from the peripheral parts, between the period of January 2004 to October 2007. The patients were put to Pre-operative evaluation, Pre Operative exercises. Under regional block anaesthesia, Lasso procedure, Opponensplasty, and Half FPL transfer to Extensor Pollicis Longus were done as the case demanded. All these patients were put to vigorous post operative exercise regimen for the tendon re-education thereafter and splinting as well. **Results :** Hand function evaluations were done at the end of every 3rd and 6th months. Any complications, deformities subsequent to surgery and exercises were noted. **Conclusions :** The results were extremely satisfying. The patients were able to hold, grasp and pick up the objects comfortably. Leprosy cured patients with existing hand deformities must undergo the surgical rehabilitation program to improve quality of living.

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Non compliance in usage of MCR chappals by leprosy afflicted has been a problem since long. To know the patient's reasons a study was conducted in Vizianagaram and East Godavari districts of Andhra Pradesh. Among those who normally use MCR chappals only 47% of them were able to continuously use the MCR footwear. The gaps are attributed to problems in getting repairs or immediate replacement. Yet 80% of the persons under study preferred only MCR footwear. Only 12% preferred to use foot-wear, other than MCR. 40% preferred to shift to other patterns if a safe and comfortable foot sole is fitted; and 25% said they have no mind to shift and the rest of 35% could not make up their mind. The results show that according to 75% of the MCR users, they have been identified as leprosy afflicted due to MCR footwear. About 80% of the persons wearing MCR chappals under study expressed that the pattern of the MCR chappal is a means to identify the disease and as per the experience of 65% of the persons interviewed, it can be concluded that one of the main reason for stigma towards leprosy is the MCR footwear they use.

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Leprosy is a disease which affects nearly all superficial structures and at all parts of the body. It affects the skin, the face, the extremities, the superficial nerves, thereby causing visible deformities and functional deficiencies. Hence the role of reconstructive surgery in rehabilitating Leprosy patients is immense. At the dept of Plastic Surgery, we are involved in treating these patients for the three decades or so. The facial deformities consist of nasal collapse with Leonine like facies. The nasal dorsum is augmented with grafts. Where mucosal shortening is exists, post nasal epithelial inlay skin grafts are put in as a preliminary procedure. Madarosis is corrected by hair grafting - free or pedicled. Large ear lobules in Leprosy are corrected by zig zag reduction. Testicular involvement leads to gynecomastia which is corrected by periareolar subcutaneous breast removal. Atrophied testes can be replaced by testicular implants. Nerve involvement in the extremities gives rise to many problems both sensory and motor. They have been widely studied and lot of emphasis given on prevention and cure. Some sensory nerve and skin transfers have been done in an effort to provide sensation to important areas of the hand. A number of tendon transfers have been described and practiced. We are doing a different procedure in my institution. It entails dermodesis and pulley advancement. Trophic ulcers require debridement. Many heal thereby, but some are intractant and require some sort of surgical intervention or flap cover. In short, surgery for Leprosy entails a thorough knowledge of reconstructive surgery and hand surgery.

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Providing improved grasp power after ulnar claw hand correction is one of the aims of lasso procedure. Studies reporting changes in grasp power with or without FDS lasso procedure are very few. Hence it was proposed to evaluate the difference in grasp power following lasso procedures in ulnar claw hand. Grasp power was measured using sphygmomanometer on 549 leprosy patients with ulnar claw hand of whom 171 had FDS of ring finger 289 Middle finger (Zancoli) 89 Non FDS lasso procedure. Pre operative assessments were made on Grasp power using sphygmomanometer. It was proposed to have postoperative assessments at the time of discharge & subsequently 3 months, 1 yr, & 5 yrs after surgery. In this paper the improvements 3months, 1yr, & after 5yrs are presented. At 3months improvements seen for Ring FDS, Zancoli & Non FDS were 15.8%, 11.9% & 17.5 Respectively. At 1 yr the improvements were 21.5%, 35% & 95% respectively. The numbers followed up after 5yrs were quite small for proper interpretation. It is concluded that in general Zancoli Lasso offers the best results. **Key words:** grasp power after lasso surgery, FDS lasso correction, lasso correction for claw hand.

Our Experiences with Re-Constructive Surgeries in Leprosy Deformities in Chhattisgarh Region

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Introduction : We started doing commonest operative procedures for deformities in leprosy since 1999. These procedures include, Lasso surgery, opponensplasty, Tibialis posterior transfer and Temporalis muscle tendon transfer for lagophthalmos. After 10 years of follow up now we are in a position to evaluate and compare the results of different RCS procedures carried out in-patient of Chhattisgarh region. **Materials And Methods :** A detailed analysis of functional outcome was carried out in patients with different deformities in leprosy. 380-claw hand (4 finger and 2 finger), 64 thumb palsy, 96-foot drop and 60 lagophthalmos were operated upon. The patients ages varied from 10 years to 50 years, majority of them being in the 15 to 30 years age group. More than 60 patients had bilateral claw hand and about 20 patients had deformities of hand, foot and eyes together. The hands and foot were supple and free from contracture right from the beginning or had a course of pre-operative physiotherapy. The thumb and finger correction carried out in two separate sittings. The operative procedures carried out includes modified lasso, Brands's procedure for opponenceplasty, TPT transfer with lengthening of tendon achillis and Temporalis muscle, Tendon transfer using palmary longus or TFL graft (modified by Dr. Vijay Kumar). **Observation :** The follow up period varied from 6 months to 8 years. In claw hand surgery the overall results obtained using standard criteria (Palnade 1976). The closure pattern returned to normal along with integration of movements in majority of the hands. Few patients had superficial minus deformity and PIP joint flexion limit after one year from surgery. In opponensplasty the range of movement was measured by thumb web-angle in relation to index, middle and ring finger. Majority of the young patient in age group of 15-30 years had 60° of range of movement. In foot-drop surgery majority of patient with average 4-year duration had range of dorsiflexion from 15° to 18°. Evaluation of operated cases of lagophthalmos was done by measuring the lid gap. The average preoperative lid group was 8 mm with maximum of 15 mm. The post operative lid gap was zero in all cases excluding 2 cases. These 2 cases has 1 mm to 2 mm lid gap left. **Conclusion :** The aim of Re-constructive surgery (RCS) in different deformity of leprosy is to improve appearance and range of movement in all cases. The surgeries advocated by Dr. Shrinivasan and Dr. Malviya have now become standard procedure for Re-constructive surgery in Leprosy. Our results are comparable with the earlier studies.

Risk Factors For Physical Incapacity at Moment of Diagnosis of 19,283 New Leprosy Cases, In Minas Gerais, Brazil

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Introduction : The association between physical deformity and leprosy has often been described in the literature, although very few reports have analysed the magnitude and significance of such association with respect to the presence of physical incapacity. The indicators associated with physical incapacity and the magnitude of each indicator on the resultant prognosis have been examined. **Methodology :** The present study is a retrospective, descriptive and exploratory analysis of a population of 19,283 patients whose medical condition was notified to the Sistema Nacional de Informações de Agravos de Notificação (SINAN, Minas Gerais, Brazil) during the period 2000-2005. The datas related to each patient were analysed using the EPI-INFO and SPSS software. **Results :** The risk of a patient developing level II incapacity was 16.5 fold higher in patients with lepromatous leprosy in the moment of diagnosis, and 12.8 fold higher in patients presenting the borderline form. The occurrence of more than one injured nerve increased the chances of a patient developing level II incapacity 8.4 times, while an age of equal or higher than 15 years increased the probability 7 fold. Individuals presenting the multibacillary form were 5.7 times more vulnerable to deformities than patients presenting the paucibacillary form. The risk of deformities was 5.6 times higher amongst patients lacking formal education. The risk of developing level II incapacity increased 4.5 times when a tuberculoid leprosy was detected during diagnosis. **Conclusions :** The identification of the factors associated with physical incapacity must be considered an important approach at the moment of diagnosis of leprosy. These factors are considered strong indicators of the prognosis of physical incapacity, allowing to planning actions for treatment and monitoring the patient with high risk of physical incapacity and deformity. **Keywords :** leprosy, physical incapacity, risk factors.

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Observation of Long – Term Efficacy of Operations on 41 Leprous Foot – Drop with Trans – Position of the Tibialis Posterior Muscle

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Objective : To determine the operation effect of the tibialis posterior muscular transposition on leprous foot – drop orthopedic.

Methods 41 cases of leprous foot – drop underwent the interosseous or subcutaneous method for operation. **Results :** The operation for 41 cases showed that it was effective in 40 of them (98%), excellent in 27, good in 8, medium in 5 and in – effective in 1. The efficacy had a close relationship with the strength of the tibialis posterior, condition of the patients such as deformity and contracture of achilles tendon, and methods of operation. Based on the analysis of the effects of operation, the interosseous method was superior to subcutaneous method. We found that some patients' plantar arches became flat after operation. For this reason, we selected 4 cases to take out the paralytic pretibial muscle, fix its distal terminal to the terminal point of tibialis posterior and its to the gastrocnemius muscle. The author modified the procedure for case of olisthe of the tendon after operation.

Conclusion : The interosseous method is superior to the subcutaneous method. **Key words :** tibialis posterior transposition ; foot – drop ; circumt – tibial procedure ; interosseous procedure.

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An Effect Assessment of Three Years Leprosy Rehabilitation Cooperative Project

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Objective : To assess the three years cooperative project effect of prevention of disabilities between the leprosy mission international and Zhejiang province. **Methods :** Project included neuritis survey and treatment, eye, hand, foot self care, footwear use, treatment of complicated ulcers and prostheses installing, regular rehabilitation interventions have been implemented to rehabilitation objects by rehabilitation professional doctors and doctors in villages. **Results :** Red eyes, hands cracks, foot cracks and ulcers of persons who have self care decreased by 74.47%35/47% 82.93% 34/41 and 36.79% 39/106; effective rate of complicated ulcers integrated treatment 30.86%(25/81); ulcers cure rate of persons who use footwear 36.89%(38/103); satisfactory rate of prostheses use 90.00%18/20. **Conclusion :** The successful implementation of project took effect to improve the living standard of people affected by leprosy, in favor of extending this project further. **Key words :** Leprosy rehabilitation Prevention of disabilities.

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Comprehensive Treatment of Plantar Ulcers of 42 Lepers for 6 Months

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Objective : In order to study the comprehensive treatment effect of leprosy plantar ulcers. **Methods:** 42 lepers lived in a leprosy colony were treated with a complex therapy, including wound clearness, appliance of Shukangbao natural ocean biomembrane, self care of foot. **Results :** After 6 months comprehensive treatment of 76 ulcers of 42 cases, we have gotten a better effect of 32.89% cure rate, 50% significant effect rate, 85.53% effective rate. It is revealed that simple ulcers and ones with short ulcer duration had much better effect. **Conclusion:** Reducing foot pressure and using Shukangbao natural ocean biomembrane, which had the function of bacteria inhibition and renewing muscle, can greatly prompt the plantar ulcer cures. It is suggested that the comprehensive therapy be spread in leprosy field. **Key words :** Leprosy; Plantar ulcer; Self-care of foot; Comprehensive treatment.

Non-Conditional Logistic Regression Analysis of Risk Factors on Disabilities of Leprosy

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Objective : Analysis of factors impacting on the disability of leprosy and provide the scientific basis for formulating the preventive strategies. **Methods :** Based upon the individual records of the living leprosy cases were collected by local leprosy workers of liaoning, using non-conditional logistic regression analysis model to analyze effective factors on disability of leprosy. **Results :** The results of single factor non-conditional logistic regression analysis are: leprosy type, marriage, education, native place, standard of living, the reaction. The results of multiple factor non-conditional logistic regression analysis are: native place, standard of living, the reaction, leprosy type. The equations of linear were $Y = -1.658 + 4.051(\text{leprosy reaction}) + 1.515(\text{leprosy type}) + 1.012(\text{native place}) - 0.002(\text{standard of living})$. **Conclusion :** The reaction, leprosy type, native place, standard of living, can significantly effect the disability of leprosy. It is very effective to prevent the disability of leprosy through controlling the reaction, treating the patient in time, made their life rich and increasing the standard of living to improve economical rehabilitation. **Key words :** Leprosy Disability non-conditional logistic regression analysis.

The Analysis of the Reasons for Disabilities in 51 New Detected Leprosy Patients in Liangshan Prefecture

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Objective : To investigate the main cause of disabilities of leprosy patients and find the effective methods to decrease the disability rate. **Methods :** the materials were mainly obtained from case reports kept in the counties CDC and database in Liangshan and then filled the questionnaire after interview with the patients, relatives and doctors. **Results :** 1. the main cause of the disabilities were delay of diagnosis and treatment of leprosy and leprosy reaction. the average delay periods were 4.92 years and the longest were 12 years. 52.94% of the causes were medical treatment problems, for example, multiple times misdiagnosis, mis-treatment for leprosy reactions. Meanwhile, 47.06% of the causes were from patients themselves. for example, 13.73% of patients did not know the disease. 17.65% of patients refused the therapy because they scared discriminations. 7.84% of patients' diagnosis were delayed due to the poverty and transportation. 2. There were 36 patients 70.59% experienced leprosy reaction most of them 90.20% developed disabilities before they were diagnosed. 3. 89.1% of villagers and 15.79% of doctors feared the leprosy patients discriminated them. **conclusions :** It is important to improve the training of primary level doctors and raise the technical level of leprosy diagnosis and health education. Long time intensive and extensive health education for the population is especially significant. **Key words :** leprosy patient disability analysis.

Effect of Microcellular Rubber on Pressure Distribution Under the Walking Foot

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Introduction : The objective of the study is to measure the effect of different Shores (softness) of 12 mm Microcellular rubber in reducing peak pressures at vulnerable areas under the foot. **Methodology :** Plantar pressure measurements can be measured using various techniques with a mat with pressure sensors placed on the insole and then making the subject to walk. Tekscan is one such machine which when calibrated is accurate and records even minor differences in pressure reduction. The pressures were measured in shoe with and without the MCR insole inserts with the subjects walking. The shores of MCR tested were 10, 15 and 20 degrees. A total of ten subjects were used. Plantar pressures from five normal persons and five leprosy patients with anaesthetic feet were measured. **Results and Conclusions :** The results showed that 10 to 15 degree shores to be optimum and 20 degree MCR was not effective in reducing peak pressures.

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Leprosy : Basic Facts for Field's Workers Engaged in Leprosy Work Under NLEP

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More than fifteen leprosy screening cum training camps for selection of leprosy cases for RCS were organized at PHCS of Lucknow, Barabanki & Hardoi districts of Uttar Pradesh in 2007 with the help of deptt of Medical Health & Rotary International. With the passage of time, the field workers involved in NLEP, require proper orientation and in-job training to improve their efficiency, motivation & service delivery so as to reach unreached cases. This presentation is for their skill development leading to effective implementation of deformity prevention & medical Rehabilitation (DPMR).

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Tuning the Motor Balance in the Fingers when Performing a Tendon Transfer for Claw Hand Correction

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When we want to correct a claw hand due to ulnar and/or median nerve paralysis, we are often faced with different degrees of clawing in the several digits while we have only one motor-tendon unit that we will use for the tendon transfer. Surgical options that we have for fine-tuning each finger in order to achieve a well balanced hand are discussed.

Poster Presentations Social Aspects & Health Education

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Political Perspective on Leprosy

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India, one of the high-endemic countries, declared elimination of leprosy as a public health problem on the 30th of January, 2006. In this campaign, the forerunners were the Central Government, the state governments, and NGOs. Political support and commitment for the cause was immense. But with India having officially declared the elimination of leprosy, there is a very strong possibility that this political commitment and support for the cause may be waning off. "Elimination", Mr. Yohei Sasakawa says, "is a milestone towards Eradication." This is true because leprosy control has reached a critical state, where, though, the number of leprosy patients has drastically reduced, the disease and the stigma attached to it remain. The need for political support is even stronger now that we have to work towards rehabilitation, integration of the leprosy-affected into mainstream society and for elimination of the stigma. Political intervention to prevent violation of human rights, to amend, modify and/or rectify the discriminatory laws of the Indian constitution related to leprosy is the need of the hour. Retaining the zeal and the dedicated political will for the work beyond 'Elimination of leprosy' is imperative.

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HIV and Leprosy : Commonalities and Differences

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In India there are nearly 14 million leprosy cured people and approximately 55 million close relatives of the leprosy cured people who suffer due to post leprosy problems. The leprosy cured people till today face the problem of discrimination stigma even to the extent of being ghettoized and excluded from main stream society. HIV/AIDS is a dreaded yet manageable disease. Today people living with HIV/AIDS is more than 38 million in the world. India is the second highest in the world in terms of people living with HIV/AIDS infection. The factor of stigma is attached to both the diseases – Leprosy and HIV/AIDS. But in case of HIV/AIDS stigma is mostly related with the personal behavior, especially sex where as in case of leprosy it is considered as God's curse. Early metaphors in both cases are death as horror, as punishment, as guilt, as slaves, and other have exacerbated these fears reinforcing and legitimizing stigmatization and discrimination. Once the person is affected by leprosy, he carries forever the adjectives of 'Leprosy affected person'. The face, place may change but the story of those affected by leprosy HIV/AIDS remain the same, all over the world. To give a human face to fight against the stigma attached to leprosy and HIV/AIDS is our prime duty.

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Training and Communication Skills

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There is a perceived need that many Health Workers working in the field of Leprosy, have expertise in their own area of knowledge, but lack the skill to pass this knowledge on to others. This course is designed to assist such a workers to sharpen their communication skills and their ability to train others. The course content is inclusive of: Effective Communication; Communication and Persuasion, Knowing Your Audience; Active Learning Principles; Group Dynamics, Course Design, Message Design, PowerPoint Presentations. Students are expected to deliver live presentations to real life situations and are evaluated on their performance. Effective communication is an integral aspect of Health Promotion and this course is designed to facilitate active learning of this prerequisite skill. A poster about the course will be submitted.

Advocacy, Communication and Social Mobilization, An Effective Tool to Address Stigma

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During our last visit to North Darfur, I was challenged by the General Director of health who said why we people working in Leprosy do not open our program to involve other sectors as it is being done in HIV/AIDS and Polio. Given that stigma against people affected by leprosy is strong in Khartoum, we decided to do Advocacy, communication and social mobilization for people affected by Leprosy and other disabilities at the opening ceremony of the TLM staff and partners conference. We targeted leaders from the Government, UN agency, NGO, people affected by leprosy and those affected by other disabilities. We distributed awards to organizations and individual who have contributed to the fight against leprosy. As a result, three newspapers, one in English and two in Arabic covered the 3 days conference; Leprosy issues were on the front page of those well known newspapers. People affected by leprosy and other disabilities were able to share meals with officials from the Government, UN and NGOs and churches Leaders. Some churches have already contacted us as they want to include leprosy in their activities. Based on that experience I believe that we need to combine those kinds of approaches with traditional community awareness activities such as community talks, radio and television magazines. **Keywords :** Stigma, Advocacy, Mobilization.

Impact of IEC Activities in LEPRO DTST Districts of Bihar

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Background : The stigma related to leprosy is the main obstacle to its effective elimination. The fear of rejection by the family & community may cause more stress than the disease itself, and may lead to the hidden cases. So IEC have to play significant role in overcoming that stigma by cooperation and collaboration with the community. **Objective :** To create awareness in communities for early reporting, remove myths, misconception and discrimination in the society. **Method :** To generate awareness in the community by various IEC methods, LEPRO provides mobile IEC van, 5 jeeps with Public Address System, exhibitions in Hatts, sticker at PCO booth & public places, small hoardings at PHCs, Panchayat Bhawans etc. **Result :** After doing this all methods of IEC we found that LEPRO districts referral of suspected cases and new case detection rate is high compared to other districts of Bihar. **Conclusion :** The use of IEC activities in the project has proved to be a good approach to detect early cases of leprosy and to bring down the stigma level in communities. Findings and detail study will be presented in details.

Level of Acceptance of Disabled Patients (Lep) by the Family

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Introduction : In the Indian society, especially in the state of Bihar various myths & misconceptions are still there in regard to the leprosy. The people are not having sufficient knowledge about the cause & consequences of the disease. Even also after treatment the disable peoples are not accepted in the family. It happens only due to the myths & misconception. **Objective :** To study the level of awareness among the people regarding leprosy, To know the level of acceptance of disable patients due to leprosy in the family. **Methodology :** Developing of specific formats in order to know the level of awareness as well as acceptance of disable peoples by the family members. 1. Collection of data on random sample basis in 9 districts. 2. FGD 50% should be women. 3. Opinion collection through prescribed format from the disable peoples due to leprosy. 4. Compilation of the data. 5. Photograph collection on any case of acceptance / non-acceptance in the community and case study preparation. **Conclusion:** The study will help to move foreword with some appropriate IEC/BCC activities. Also it will provide the right direction to know the needy areas for creating awareness and sharing information. Details will be presented during presentation.

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While medical efforts to conquer leprosy have made tremendous progress in recent decades, it is fair to say that efforts to tackle the disease's social dimension have lagged behind. Due to the general public's ignorance, misunderstanding, indifference and fear, millions of people cured of leprosy and even their families still suffer from the stigma associated with the disease. The problem of discrimination is still deep rooted in India and many countries all over the world. There are many examples where leprosy has been an excuse for Human Rights violations in child custody battles or dispute over property inheritance. From Brazil to Japan, laws were enacted that reflected prevailing attitudes towards leprosy, legitimizing the segregation of those with the disease. Those days of enforced isolation are now over, but they remain an uncomfortable legacy that continues to color the public attitudes. The monotherapy era (single drug, dapsone) improved our knowledge, the objective became one of the controlling the disease and the strategy shifted from institutionalization to case detection and out patient treatment based on survey-education-treatment (SET). The SET approach subsequently developed into Information-Education-Communication (IEC) strategy. The MDT era further refined our understanding of the disease. The era not only saw consolidation of IEC activities but also emergence of Community Based Social Action (CBSA) strategy. We now need to strengthen our system and focus our programmes on IEC activities and CBSA strategies to integrate leprosy affected persons socially, economically and legally.

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Introduction : Leprosy is a disease surrounded with unique social perceptions. Many disabled persons are either forced to leave their families and live in leprosy colonies. In Bargarh sub-division with 7,60,411 population there are 4 colonies of Jirandi, Jamurda, Rohinia and Jhanjore. This paper presents the various responses collected from 256 colony inhabitants. **Methodology :** The colonies were visited by the workers and information was collected through the questionnaires, personal interview and observation. The issues on which information was generated were vocation, sanitation, personal hygiene, education, self stigma and support they have received from govt. and philanthropists. **Results :** The number of families and population was 366 and 976 respectively. Colonies were supported mostly by the missionary organizations. Regarding occupation, begging is the most common one practised by 218 (81%) of 256 respondents. This was followed by manual labour adopted by 22 (8.6%). 142 (55%) expressed change in life style due to disability. Only 20 respondents (19%) have relation with the family, 10% still bear the hope of returning to the village. Only 7% hope that they will be accepted by the family. Regarding the disease status from the entire population of 976, 444 (45.5%) are cured persons of which 379 (85.4%) are disabled. All cured persons have received support from govt. and other agencies and some have availed from multiple sources. **Conclusions :** Disabilities make the people live in colonies Begging seem to be the commonest occupation for livelihood among the population living in leprosy colonies Very small number keeps contact with the family Many have received support from govt. and other agencies. **Key words:** Disabled, Vocation, Self stigma, Cured persons.

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1. In Gaya which is about 110km from Patna has three leprosy colonies. In these three colonies there are altogether about 700 people living in these colonies with their families and children. Each leprosy-affected people has his own pucca house on his own land. There are facilities of water and electricity. There is a government leprosy hospital beside these leprosy colonies from where all the leprosy affected people get medicine. There is provision for children's education and some of them are studying in boarding schools. Old age Pension and Social Securities Pension is available to all the affected ones. About 200km away from Patna there is East and West Champaran where we have Chakiya Leprosy Colony, Pipra Leprosy Colony, Gandhi Leprosy Colony (Kumarbagh). In these leprosy colonies there is water facility but there is no electricity connection, none of them have pucca house. They live in huts made of straw and grass. They do not have their own land. Everyone gets old age pension. In Bargania and Chainpur Leprosy Colonies there is no electricity, no land of their own and none are getting old age Pension. They have drinking water facility. Dhaka Leprosy Colony in East Champaran has pucca houses, electricity, solar lights, water and everyone is getting old age pension. In Ramgarhwa Leprosy Colony there is electricity, water and old age pension scheme. For children's education there is a school in the leprosy colony itself. The houses are quite old and water leaks through the roof during rain. Ghora Sahan Leprosy Colony has pucca houses but need urgent repair. There is water and everyone gets the old age pension. There is no ration card. Chauradanu Leprosy Colony has pucca houses but need urgent repair. Forty people get pension and rest are not. Janki Leprosy Colony in Sitamarhi has pucca houses, electricity, water, school for children and all get old age pension. But the houses are old and they need urgent repair. Laxman Nagar Leprosy Colony in Sitamarhi has pucca houses but need urgent repair. There is electricity and water and old age pension scheme. Bhairon Ganj and Chanpatia Leprosy Colony have pucca houses but need urgent repair. There is a primary school in Chanpatia Leprosy Colony. None of them get old age pension. They have their own land. Arrah Leprosy Colony in Bhojpur district does not have their own land. This colony has huts. There are three hand pumps, ration cards and old age pension. 250 leprosy-affected people live here. Motipur Leprosy Colony has pucca houses, own land, old age pension, water, school for children but no electricity connection. About a little distance away from Patna there are two leprosy colonies in Khagaul- Ram Nagar and Prem Nagar Leprosy Colonies they have water facilities, electricity, old age pension, ration cards, a non-functional school. Children go outside to study. Very long time back a pucca school was built in Ram Nagar Leprosy Colony in which I taught to the children of leprosy affected people for 22 (twenty two) years, now which is non-functional due to scarcity of fund. We are trying to re-open it and your kind help is needed. Leprosy affected people of Bihar do not get any help from any organization. I have visited all the 45 (forty-five) leprosy colonies of Bihar and got them made ration card, old age pension, red cards and in many got installed hand pumps for drinking water. I do not get any help to visit these leprosy colonies. Frequently I keep visiting the S.D.Os, D.Ms and Chief Minister. About 20 colonies in Bihar need urgent repair work. We would like that each leprosy colonies of Bihar should have vocational training centers, good education facilities for children employment for their unaffected family members and cease of begging.

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As the world-wide number of newly diagnosed cases with continue to decline, the impact of stigma remains stable, or in some instances, increases. The effects of stigma do not only impact the person carrying these bacilli, but his/her extended family as well. With this in mind, it is important for organizations that fund/provide HD related programs to practice the art of inclusion. This "art" can be embraced by small and simply run organizations, as well as large, complex entities that may operate on an international level. The purpose of this presentation will be to show how these practices of inclusion can play an important part in the decrease of stigma. These practices can include, but are not limited to: printed materials in a common language, verbal communication in non-technical terms, acceptance of volunteerism, active search for guidance in policy development, and assignment of legitimate status in program implementation. Exclusionary efforts, like devalued paper money, can quickly lose its luster if the appropriate support is not present. The presenter will also discuss some examples of personal involvement on boards.

Sustaining Leprosy Awareness Through Selective Special Drives (SSDs) in Rural Areas of Maharashtra State, India

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The key success of the leprosy control programme was early detection and prompt treatment with MDT. Promoting voluntary reporting of new leprosy cases through leprosy awareness activities is the only means of detecting new leprosy cases after the integration. It has been realized that general IEC campaigns has not resulted in increasing the number and timely self-reporting of new cases. ALERT-INDIA has implemented Selective Special Drives (SSDs) in the rural districts of Maharashtra through selected NGOs under LEAP partnership programme. Focussed IEC campaigns were undertaken by the NGO staff during SSDs and reached the people with basic information on the signs and symptoms as well as facts about leprosy through specially trained community volunteers. An intervention study was conducted to measure the effect of focussed IEC under SSD in the community. 1200 randomly selected individuals from 4 villages (2 non SSD and 2 SSD) in Gondia and Wardha districts were assessed for their level of leprosy awareness using a pre-structured questionnaire. The questionnaire survey was repeated at regular interval to know the sustainability of leprosy awareness. At the end of 3rd round, there was a 4 fold increase in sustaining the awareness among communities exposed to SSDs. The study also confirms the influence of focussed IEC activities carried out by community based NGOs and volunteers in increasing the level of knowledge and sustaining the leprosy awareness that has resulted in voluntary reporting of new leprosy cases.

Local Print Media Coverage on Leprosy – Study in West Bengal, India

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Introduction : After introduction of MDT the face of leprosy has changed & the world is running towards leprosy-free. The deformity of the society is still prevailing in many areas despite many efforts. Local media (both electronic & print) can play a vital role in opinion building by covering leprosy related positive news. **Methodology :** 50 randomly selected news from state level Bengali news paper were analyzed. Covers were mostly negative attitude of the society towards lepers, media conferences of health officials, some exemplary dedication of some people. Details of the result will be shown by chat & graph. **Conclusion:** local media must be more sensitive, updated, should be constructive minded to built peoples opinion to fulfill "leprosy free world" **Key-words :** Print Media, "Leprosy free world".

Evaluation of Participation Restriction in Hansen's Disease After MDT : A Brazilian Experience

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Participation restrictions are problems experienced in any life situation or context. The application of a scale to measure social participation is necessary for use in rehabilitation, stigma reduction and social integration programmes. The objective of this study was to evaluate the social participation of people reached for hansen's disease (HD) after MDT in a Municipality of the Northeast Region from Brasil - Sobral, Ceará. We use the Participation Scale (v 4.6) to quantify the restrictions in people reached by HD, based on the participation domains of the International Classification of Functioning, Disability and Health. This scale is a new 18-item interview-based instrument. Sixty-nine subjects, 10% of the total number of cases from 2003 to 2005 in this municipality, were evaluated. As a result of the final classification: 64 (92.8%) had no participation restriction, 4 (5.8%) had mild restriction and 1 (1.4%) had severe restriction. The case with great restriction was directed for psychological attendance. The scale allows collection of participation data and impact assessment of interventions to improve social participation. We consider the participation scale easy to be applied in the health services and can be used as useful tool for the integral attention of the people reached for HD. **Keywords :** Hansen's Disease; Participation Scale; Stigma; Disability

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Hansen's disease is still a problem to some countries in the world and nowadays internet is everywhere giving access to information to everyone: a solution to that problem. Teaching is the only way to achieve controlling this endemic disease and by using internet even those people who live far away from big cities can know the first signs and symptoms of the disease making possible early diagnoses when patients don't have disabilities. For these reasons Fundação de Ensino Superior de Passos (FESP-UENG), Secretaria de Estado da Saúde de Minas Gerais (SES-MG) and Netherlands Leprosy Relief (NLR) created the Portal da Hanseníase. Portal da Hanseníase is a web site open to whom wants to know about Hansen's disease and it also has free of charge courses to those who works with the disease. Since it was inaugurated in August 2007 it has received more than 11.000 visits and has more than 500 persons attending to its classes. Its official language is Portuguese but it's our intention to translate all classes to Spanish and English. Authors: Maria Aparecida de Faria Grossi Pieter A. M Schreuder Carlos Alberto Faria Rodrigues Jorge Luiz Costa **Key words** : leprosy, internet, teaching.

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Introduction : Since total population survey is not acceptable in large cities and towns, advocacy work needs to be done through Electronic Media, Print Media and folk media (meetings with various groups in the community). **Objective** : School teacher are the strong opinion builders whose help should be sought to make – Leprosy a discussable subject in the community, providing the knowledge of mode of transmission, infectivity, complete curability and the need of psycho social support of the patients. **Material & Methods** : In each school of project area, with the consent of management, 1 ½ Hrs lecture programme may be conducted. After signing in the participant's register, the teachers are first asked to attempt and return a constructed, printed questionnaire within 10 minutes, asking as to what he or she knows about leprosy. 1. Whether it is a (multiple choice) 1. Curse of God 2. V.D.3. Hereditary 4. Caused by germs 5. Don't know. 2. It's mode of transmission is through : 1. Water 2. Air 3. Contact 4. Mosquitoes 5. Don't know 3. Affects which organ ? 1. Blood 2. Vital organs 3. Intestine 4. Skin 5. Don't know 4. Its common skin patch is : 1. White 2. Itching 3. Pale sensation-less patch 4. No patch 5. Don't know. The questionnaire continues of ask in Yes or No or Don't know whether 5. Whether a patient with deformity is highly infection. 6. Leprosy is totally curable? 7. A student patient should be separated? 8. Would you like to purchase vegetables from a normal looking person known to be taking treatment for leprosy? After collecting the answer sheets (K.A.P) a 4-50 minutes talk with the aid of album or slides may be delivered particularly describing the various causative organisms like cholera, plague, syphilis, mycobacteria of TB and leprosy? The immunity and how the two types emerge etc. The session ends with distribution of hand bill containing also the list of clinic points in the area. **Conclusion** : This methodical education programme to the well-educated group seems to have a firm place in the urban leprosy elimination programme giving it a positive look, promoting voluntarism in the people for examination of skin patches and achieving other objectives.

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Introduction : Despite great investments in IEC activities, knowledge and particularly attitudes to Leprosy is poor among different strata of the society in rural Maharashtra. **Methodology** : Using a specially prepared questionnaire in vernacular and qualified investigators, 485 general community members, 214 teachers, 197 Government Officials And 93 Grassroot health staff were randomly chosen and interviewed on Knowledge about signs, symptoms, cause of Leprosy its mode of spread, treatment & Attitude towards people affected by Leprosy. **Results** : About 35% of the General Community and teachers as compared 50% among officials and health staff have actually seen leprosy. Their knowledge was thus quite poor even in recognizing leprosy or listing the early signs. Even among health staff, the knowledge on causation and transmission seems quite low. Only 50% stated that leprosy is curable, and the treatment is free. The attitudes of the people from all strata of society are negative and based on ignorance and misconception on the transmission of the disease. **Conclusions** : Widespread ignorance and negative attitudes still prevail in rural areas of Maharashtra and unless corrected can impede eradication of leprosy and its consequences and be the main invisible barrier to their getting equal rights and a life of dignity.

Impact on Awareness and Advocacy in Relation to Social Acceptance and Improved Quality of Life

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Objectives : This study was designed to study the impact of awareness and advocacy with the families affected by leprosy and the physically challenged, the effectiveness of social acceptance of the leprosy community, the social integration of the marginalized in the society and evaluate the effectiveness of the micro enterprise activities and Self Help Groups. **Methodologies:** Tools for Health promotion activities carried out for the public, by available means, including word of mouth, including experiences shared by former patients, school activities, including quizzes and essay competitions with prizes, public talks, announcements, plays, puppet shows, posters and leaflets (less useful where literacy is low) and mass media, IEC materials, including newspapers and local radio, TV, video, DVD. **Result :** Information, Education and Communication (IEC) materials played an active role in awareness. The Community Learnt that the leprosy was curable and can be cured with drugs that are widely available and are free-of-charge. **Key words :** impact of advocacy programmes, social acceptance in leprosy.

Self Help Group - An Integrated Approach For Socio-Economic Development of People With Affected by Leprosy And Disability

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Introduction : Self Help Group (SHG) is not new for Indian community but it's a new experience for the people affected by leprosy and disability. Several Govt. schemes implemented for poverty alleviation in Chattisgarh like (IRDP, SGSY, RMK, SWA SHAKTI and Now Nawa Anjor) but these section of people were left behind. After the implementation of the State wide SHG Project Chattisgarh from October 2005 there is a significant change in the life of the people. **Methodology of the study :** 800 beneficiaries were interviewed (with equal number of both genders). Leprosy affected and those with other disability were interviewed in Hindi by qualified social workers in eight districts. **Results :** Change in the attitude of the people, in economic conditions, in social participation and in the attitude of the community towards the Leprosy affected and disabled were seen. Also effected were the accessibility/ and utilization of services and resources available in the community. **Key words :** socio economic development in leprosy, self help groups in leprosy.

Leprosy Awareness Among Urban School Children in Nepal

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Introduction : School children form an important section in a community and change agents. A study was done to assess their knowledge on leprosy transmission and perception of leprosy. **Methods :** A random sample of 40 (18 boys and 22 girls) students studying in grades 8-10 in a school in Kathmandu were studied. Sixty percent respondents reported that business was the main occupation of their father. Majority of the respondents were from Newar ethnic group (62.5%) followed by Chhetri (20%). **Results :** Although, all of the respondents reported that 'they have heard about Leprosy', only 10 (25%) students knew about the causative organism of leprosy. 55% of the respondents came to know about leprosy through TV. More than 60% of the students were well aware about the complications of leprosy. They said that all the persons infected will get leprosy and some of them would die. A remarkably high 100% of the respondents were in favor of introducing Leprosy awareness topics in school curriculum. **Key words :** Leprosy awareness, awareness in school children.

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Leprosy mission Nepal launched a 5 years project called CAP from July 2005 in the Bara district of Nepal with the aim of mainstreaming leprosy affected persons by developing resources within communities. A detail feasibility study was carried out and the project was designed based on the findings collected. After the selection of areas, a series of meetings were held with leprosy affected, physically disabled and marginalized groups of people as well as with influential community members regarding project concepts. Once beneficiaries were convinced, a self help group (SHG) comprising 15 to 20 members from 3 aforesaid categories in each village development committee were formed. All together, 31 SHGs were formed and different activities were conducted to empower the beneficiaries. Then all groups were registered as Community Based Organization in local government. When each group become matured, they formed a cooperative and register in government. Now each SHG were focused and health aspects were cooperative started micro-finance and community welfare activities. Now this project has completed only 2 years. However, some lessons are learned that covering whole community instead of working only with specific clients would be more effective. Similarly, some impacts have been seen. Now, the leprosy affected are not hesitant to disclose their disease status and their social participation is increased.

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United Nations has brought out various Conventions and Treaties to address specific problems of the society and its population. The legally binding international document in the name of "United Nations Convention on the Rights of People with disabilities" guarantees a number of rights that could help people with disabilities to live a life with dignity. Proper Survey should be taken to find the genuine figure of disabled persons, district, state and Nation wise with door to door certification on disability carried out by a team of doctors. There should be specific and time bound guidelines to developing countries in respect of providing the basic needs such as food, clothing and shelter to people with disabilities. Provision of basic needs to people with disabilities should be immediate. Thickly populated countries like India should be observed whether they support all or only few for names sake keeping very strict selection criteria. The current history that a poor disabled person has to live on begging should be rewritten. Financial assistance should be given directly by the governments through banks not through any other agencies to avoid further exploitation and misuse. People affected with leprosy should be given special consideration as their situation is peculiar. Once ratified, there should be more strict monitoring system in place on member countries and they should be made more answerable for violations. **Key words** : UNCRPD, disability, rights.

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In order to know the knowledge and attitude about leprosy among the VTC students, this study was carried out among 297 VTC students from Nashik and Vadathorasalur. The Questionnaire consisting of Basic Knowledge about Leprosy, its Psychosocial and vocational aspect were prepared, tested and administered in local languages. The data was compared on the basis of students Affected with leprosy , Leprosy background and physically challenged and students among 2 VTCs. Statistical Analysis were done in each group by gender, poverty, educational status of the parents and compared. It was found that the knowledge of leprosy among the students were inadequate in the cause, communicability, MDT treatment, MCR chapel wearing and eye involvement in leprosy. 50% of the students does not perceive key goal of vocational Training. A majority of the students feel fear about future is the main cause of worry followed by people's rejection. Social stigma and poverty were the greatest threat to the leprosy affected people. Only around 30% of students feel that the leprosy affected people can stay in common residential area. Only 110/ 296 students feel free to buy from leprosy affected vendor. Majority of students were referred by TLM Hospitals followed by public health centres (Comparisons to be done between students of 2 VTCs., between Leprosy affected, Leprosy background and with Age, Sex, educational status of parents and the poverty level of parents). The study reveals that the inadequate knowledge and social stigma still remains even with the persons with leprosy background. Proper understanding about leprosy should be taught to family members. A Comprehensive Occupational Therapy Programme with the Wholistic approach is essential for the VTC to functionally empower the students. **Key words** : awareness of leprosy, VTC students.

P-339**Awareness and Attitude to Leprosy Among the Industrial Employers in Nashik****Berry Bino Shadrach and K Illavarasi**

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It is observed though quality training is being provided in Vocational Training Centres meant for the leprosy afflicted, job placement has still been a problem and leprosy related social stigma can be a reason. To know the reasons for unemployment 200 Industrial Employers randomly selected from the NIMA (Nashik Industrial Manufacturers Association) Directory have been studied using a questionnaire that consisted of 10 simple questions about awareness and attitude towards leprosy through direct interview with the subjects i.e. General Managers, Chief Executives, HRs from Big, Medium and Small Scale Industries. The findings revealed that majority of the employers know that leprosy is caused by an Infectious Bacteria followed by poor hygiene & hereditary, is highly communicable, needs about 5 years treatment and deformity becomes normal in Long run. Almost all of them agree with the fact that it affects the people who have less body resistance; cured leprosy patient rarely spread disease. Majority of them feels sympathy when they see leprosy affected persons and feels sorrow for them. About employing a leprosy afflicted person, only about 30% said 'yes' while the remaining said 'No' or 'Can't Say' with the main reason being that other employees do not cooperate with them. **Key words** : awareness to leprosy, in industrialists.

P-340**Quality of Life of Residents at an Aged Home for Destitute Leprosy Patients (Snehalaya) at Faizabad, India****P Barkataki and A Barkataki**

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Due to stigma and lack of effective treatment for leprosy and its deformities in bygone era, several patients were rejected by the families & societies, who became homeless or lived in colonies provided by Government or NGOs like the Leprosy Mission. The study examines the quality of life of TLM home for aged destitute patients (Snehalaya) and how it differs from those living elsewhere. A questionnaire, adapted from 'WHO QOL-100' was used on all 40 residents. A random sample of 40 patients from nearby government colonies and another sample of 40 persons were interviewed from the communities, where the persons lived with their respective families. In general, persons in Snehalaya or in colonies showed poorer quality of life in most of the domains examined as compared to those living with their families. With the early detection availability of MDT and all the associated support services being provided by the Govt & the Leprosy Mission, our aim should be to keep the patient placed in the family and community, no matter how difficult the problem, putting in more effort through advocacy, counseling and health education. **Key words** : old aged homes, leprosy homes, quality of life.

P-341**Awareness and Attitudes to Leprosy Among Urban Slum Dwellers in West Bengal, India****S John Anamma and PSS Rao**

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Urban slums have proliferated in all cities of India. The residents of these slums generally migrants, mostly illiterate, with poor amenities. Leprosy is a disease of poverty, shrouded in stigma leading to gross disabilities, if not treated early. A representative group of slums were chosen from different parts of Kolkata, the capital of West Bengal state, and a door-to-door survey carried out using a special research proforma to interview a random sample of heads of households to assess knowledge and attitude towards leprosy; and to identify untreated cases of leprosy, enquiring the reason for not reporting. A sample of 600 persons were interviewed, 299 men and 301 women. Only 20% had high school education, and mostly in unskilled labor. 90% knew about leprosy, but only a third could mention the causative agent. Only half could state correctly the early signs and symptoms. Only 55% felt the deformity or ulcer was preventable. 40% stated that the affected person will hide the disease due to fear of stigma. There were 6 cases of leprosy in the areas studied, 2 not yet reported. The study emphasizes the need to educate and motivate slum populations to report promptly and take regular treatment. **Key words** : urban slums, attitudes to leprosy.

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Community Based Rehabilitation is an Effective Intervention to Increased Community Participation & Social Acceptance of Leprosy Affected to Improved Quality of Life

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Introduction : Individual interests of the people affected by leprosy are usually ignored in the collective interest of the family and the community. Efforts to reduce such problems of the leprosy affected require systematic documentation of facts relating to the factors underlying such problems. The Study emphasizes that people disadvantaged by leprosy across India gain a sustainable improved quality of life due to CBR intervention. **Methodology :** Research designed and methodology has adopted which applies to social science. Case study methods have been used for collection of data in the proposed study in nine selected units. **Result :** The CBR Programme has reduced the incidence of poverty through increase in income, enabled the poor to build assets. 80% beneficiaries have increased independence in daily life through educational support. 75% beneficiaries have increased the participation in community decision making. 65% beneficiary increased in their ability to meet common needs and 80% beneficiaries have reported increased social acceptance and involved in the planning. **Conclusion :** The Study has revealed that the leprosy affected and other disabled has shown increased participation in the decision-making process in south India. **Key words :** community participation, quality of life in leprosy, increased community participation in leprosy.

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Development of an Action Plan for CBR, TLM India : Bringing Culture and Participation into Focus

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Background : It has been said that the way people behave and participate in programmes is largely dependent on the local culture of the community they live in, which includes people's beliefs, practices, and traditions. The way in which culture affects and works is important as community development activities take place in a cultural context. This preliminary study explores the importance and influence of culture and participation in development projects. **Methods :** Relevant literature on culture and participation were reviewed. Three TLM centers were chosen by purposeful and convenient sampling for situation analysis. The situation analysis was done, by circulating a questionnaire by email, to explore the importance and in influence of culture and participation in TLM programmes. The collected data was summarized and was analysed on themes drawn from research questions. **Findings :** There is a clear link between local cultural values and the challenges people with disabilities (PWDs) face, and they are not the same across the country (India). Explicit acknowledgement of cultural aspects in TLM CBR projects is not found from the available data. Stakeholder analysis reveals that local community and community health workers have high importance and high influence in TLM projects. 'Women's participation' and 'migratory populations' are some of the major challenges analysed. **Key words :** rehabilitation, disability, action plan.

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Extent and Correlates of Leprosy-Related Stigma in India

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Leprosy is perhaps the most stigmatized of all diseases even after several decades of successful leprosy control work. Further, progress towards eradication of leprosy will depend on a significant reduction of societal stigma. In order to know the level of stigma prior to intervention, an exhaustive baseline survey was conducted in three states viz. West Bengal (Purulia dist), Uttar Pradesh (Faizabad dist) and Chattisgarh (Jangir dist). Nearly 2,400 community member (heads of households) and 600 leprosy patients were interviewed. Further, 60 key informants were interviewed in depth and 100 focus group discussion were held to probe into origin of stigma, how it could be reduced and eventually eliminated. Restrictions are observed with regard to vital aspects viz. domestic work, level of participation in rituals and puja, place of sleeping and bedding, sharing food and articles, using services of barber, taking bath in the same pond, participation in casual recreational/social activities as peers etc. Services of priests are available for use for all the respondent patients. Data revealed that patient's appearance such as deformity, dirty look and bad smelling ulcers are the main reasons of stigma which has strong correlations with state, religion, caste, economic dimension and literacy level etc of patients and the community. Generally, there was a favorable attitude towards reducing leprosy stigma and communities are enthusiastic to take initiative in the above programmes. **Key words :** extent of stigma in leprosy.

Assessment of the Extent and Correlates of Participation Restrictions of Leprosy Patients

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There are many stigmatizing conditions which result in social participation restrictions of the affected and their family members. It is often believed that leprosy patients are one such group the most suffered from social participation restrictions. However, since there has not been any agreed measurement to assess the extent of restrictions, the TLM has developed an interview based culture free Participation Scale (P-Scale) to quantify the extent of participation restrictions at individual level. A study of application of the standardized P-Scale, for identifying participation restrictions and their associates with leprosy characteristics has been conducted. A total sample of 300 leprosy patients randomly selected by representative sampling from those taking treatment from The Leprosy Mission Hospital, Shahdara, have been interviewed. Simultaneously an equal sample of 300 patients taking treatment from the same hospital for diseases other than leprosy, served as a control group for comparison. Based on the total P-Scale score secured by each respondent, ranging from 0-90, the respondents are categorized into 5 categories i.e. no significant restrictions(0-12), mild restrictions(13-22), moderate restrictions(23-33), severe restrictions(33-52) and extreme restrictions(53-90). The results show that the visible deformed leprosy patients face *extreme participation restrictions* and significant variation between the leprosy afflicted and other diseased. **Key words** : community participation in leprosy.

Perceived Stigma of Leprosy Patients with Visible Deformities in Three States of India

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Apart from the stigma manifested by the community, patients' perception of being stigmatized, a result of their physical appearance and visible deformities could contribute to overall leprosy stigma, which needs special attention. To assess the perceived stigma of leprosy patients, 265(45%) visible deformed and 325(55%) without visible deformities have been randomly selected from hospital records and studied from three states viz. West Bengal (Purulia dist), Uttar Pradesh (Faizabad dist) and Chattisgarh (Jangir dist) have been studied in depth. Quantitative data analysis confirms presence of restrictions with in the family, community and workplace on those with visible deformities as well as without visible deformities. The degree of restrictions as perceived by the patients with visible deformities and without visible deformities has been compared with regard to movement & domestic life in the family, sharing and participation in the family, movement in the community, participation and receiving the civil services such as barber, bathing pond etc from the community, sharing and participation in workplace, admission of children in schools, and treatment in hospitals etc. Chi-square test shows that the level of stigma as perceived by patients is significantly more among those with visible deformed than the others, in most of the contexts and the situation is more or less the same in all the three states. **Key words**: stigma in leprosy, deformity in leprosy, deformity and stigma.

Prevalence Of Stigma in Relation to Religion and Social Class in Three States of India

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While stigma against leprosy patients and families is a universal phenomenon, nature of stigma varies as per the culture in which religion and social class play a significant role. In order to weed out intervening factors, a baseline survey analysis was conducted prior to intervention programme, in three states viz. West Bengal (Purulia dist), Uttar Pradesh (Faizabad dist) and Chattisgarh (Jangir dist) covering nearly 2,400 heads of households. Community's experiences and attitudes towards accepting the leprosy patients in the family, community, and workplace have been analyzed against the social class and religion. The castes in India are categorized into 4 groups i.e. Higher Castes (HC), Scheduled Castes (SC), Scheduled Tribes (ST) and Other Backward Castes (OBC). To cite an example, on an average 324(57%) of the respondents from Faizabad, 501(72.8%) from Purulia and 291(60%) from Champa, agreed with playing of healthy children with children of leprosy afflicted, the caste wise analysis shows different influence of caste in between the states. While, it is slightly higher among HC(60%) and least among ST(46%) in Faizabad, higher among HC(72.8%) and least among BC(58.3%) in Purulia and least among higher caste(4%) and higher among SC(64%) in Champa. This paper also presents several instances where the influence of caste is found to be different due to probable social reasons. **Key words** : stigma and religion, leprosy and religion, stigma in leprosy.

Inhabitants of a Former Leprosy Colony in Northeast Brazil : Isolated and Stigmatized

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Despite abolition of compulsory segregation of leprosy patients in 1962, we still find 33 former "leprosy colonies" in Brazil, voluntarily inhabited by around 3.000 ex-patients. These people have been expelled from the public sphere in the past, since then not being reintegrated. We performed a cross-sectional study to describe life circumstances in a state-run former leprosy colony in Redenção (Ceará State). It is inhabited by 90 ex-leprosy patients and 86 non-affected family members. Data were collected from records, and a questionnaire was used to collect demographic, clinical, and socio-economic variables, and information on social networks. Leprosy-affected inhabitants were significantly older than non-affected (mean age=61,5 years and 20,0 years, $p<0.001$). Of the 77 (86%) interviewed leprosy-affected individuals, 56% never attended school and 86% received a state pension. Seventy-three% presented visible physical deformations, 34% were not in contact with their families outside, and 40% expressed lack of social integration. Due to the state pension, residents are not considered extremely poor, but leprosy control programmes urgently need to include social integration of the inhabitants of former leprosy colonies.

Leprosy and Estatal Imposition

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The present study aims to examine the relationship between the Brazilian state and public health in the first half of the twentieth century, having as joint question the politics of obligatory isolation of the carrying patients of leprosy and the reactions to the same one. The theoretical instrumental chosen can be summarized through the definitions of State and *bureaucratic field* developed by Bourdieu, P. coercion and consensus from the indications of Antonio Gramsci A and developments of Godelier M. The documentary *corpus* of this work consists of oral sources, interviews from the research project "Memories and history of Hansen's disease in Brazil. From these theoretical assumptions, we found in the documentation rather than mere acceptance of state policies that are violent (the compulsory isolation), but the operation of mechanisms that by the naturalization of such practices, creates and maintains a popular demand for these types of domination and imposition. The construction of the state is only possible through their naturalization undertaken by physical and symbolic coercion. However, the acceptance (or even demand) required for the establishment and reproduction of state power can only be built and distributed by consensus. Leprosy; Health Public Policy; Patient Isolation; State.

Help-Seeking Behaviour : Patients' Enlightening Stories

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While studying help-seeking behaviour amongst leprosy cases in a low endemic district or northern Bangladesh, we identified several themes which suggest possible methods of intervention for improving early case detection. Trained health workers interviewed a consecutive series of 38 recently-diagnosed leprosy cases to discover the sequence of actions/events which had led to their diagnosis, or had delayed their diagnosis, and to identify those people most influencing the patient's behaviour. Thirteen stories indicated that the new patient was led to the leprosy clinic by a previously-treated person (of whom 6 were related to him/her). Most of the patients (15) who had earlier sought advice from a general health worker, had wasted money on inappropriate treatment or received misleading advice. Six sample stories will be presented. Those who have already been treated for leprosy are an unrecognized effective force for bringing new cases to the attention of the leprosy programme. With encouragement, these people could do more to help with early diagnosis. A deliberate effort to harness this resource led to 22 more patients being detected in the area over 6 months. **Key words :** help seeking behaviour, early case detection, treated patients.

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Role of a Health Education Media Centre Towards Eradicating Leprosy From This World

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Role of Eradicating Leprosy from this world For the last 6 year media Centre affectively providing vital information to the grass root community through TLM projects and centres providing creative & effective communication material in video, audio and print media. Secondly organizing various advocacy events in community level and school. Providing most effective training for community representatives (Panchayati Raj) different faith, Religious Leader, Health workers and Volunteers for their capacity development on behavioral change and communication skills and also good media advocacy component. Simultaneously the research unit providing need base information for developing IEC materials along with pre and post test of communication materials. **Key words:** role of education, leprosy eradication.

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Testing LEC Materials for Optimum Effectiveness

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Introduction : Information Education & Communication commonly abbreviated, as IEC is an integral part of leprosy control program. To facilitate this program, several audio-visual aids are produced. Many of them may not have been properly field tested for better reach and greater impact. Without such scientific assessment prior to dissemination, the outcomes may result in poor effectiveness and wastage of scarce resources. Such an evaluation must be done scientifically with proper methodology.

Methods : In this paper, findings from a study testing selected IEC materials (posters, pamphlets, booklets, docudramas and spots) were tested. Four target groups (children, leaders, women and men) were used in three states of India. Effectiveness of the aid in terms of message clarity as well as on visual appeal, language, characters used if any, comprehension, reaction/opinion to the format used etc were determined. **Conclusions :** Research is imperative in production of effective IEC materials. **Key words:** audiovisual aids, IEC material, field testing.

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The Role of English Translation in the Promotion of Stigma

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As increasing attention is paid to the role that language plays in either promoting or reducing stigma, it is important to look at how translators may have contributed to the stigma associated with leprosy. More than 300 pages of letters, written in Hawaiian by the early residents of Kalaupapa, have been translated into English. Some letters that had been translated previously were re-translated. It was observed that the residents of Kalaupapa referred to themselves in a number of ways that used the word "person" prior to mentioning the disease, i.e., "the people sick with leprosy" and "the people overtaken by the leprosy disease". However, in many cases, the translators chose to simply use the word "lepers", thus imposing the stigmatizing Western terminology on the Hawaiian culture, a culture that did not have a tradition of stigmatizing individuals because they were sick. It is likely that this has happened in other countries where Westerners translated the words of indigenous people and, in so doing, attributed behavior and values regarding leprosy to people that were not originally a part of their culture. Recommendations are made to sensitize translators today so that they do not unintentionally contribute to the stigma associated with leprosy.

Key words: Stigma, Language

A Survey of the Knowledge and Attitude About Leprosy for a Part of Floating People in Beijing

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Objective : To understand the status of leprosy health education in the floating population and to study the improving way to leprosy health education in them in order to control the disease transmitting. **Methods :** The investigation of the floating population in more than 60 person was done by the investigation forms about the knowledge , opinion and behavior of leprosy. **Results :** They showed that knowledge of the disease was not widely known. More than half the respondents did not know the early symptom of leprosy and how to preventing leprosy. Although most respondents did not display prejudice in their own responses, many implied that prejudice was still present in the wider community. It is evident from the study that some prejudices and misconceptions still exist. **Conclusion :** It's an important way to popularize and improve the knowledge of leprosy among the floating population through publicizing . It is these population which health education should focus upon.. Also doctors in the hospital will be trained for diagnosis leprosy in the early stages and at the same time it will be to set up the inspecting way for the floating population. **Key words :** Leprosy Floating population Health education.

The Influence to the Lepers Economy, Disability Recovery and Social Communication After Provide a Miniature Loan to the Family

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Objective : To increase the economical income of the leprosy family and accelerate the ability of their deformity recovery and strength their sociability. **Methods :** The loan contract was signed by The Amity Foundation and the local leprosy control unit. According to the application of the leprosy patients, the local leprosy control unit confirmed the target of the family and signed the loan contract. **Results :** In the year of 2005 and 2006, after enforced the loan in miniature, the incomes of the 131 leprosy families has increased up to 14.45% and 16.42% respectively; the average number of the patients social communication has also increased up to 15.5% and 20% each. The popular rate of the patients self-attendance was obviously rise after the loan. The rate of the leprosy knowledge of the villagers was 24% and 70% before the loan and the later. 4 patients were revelation in the whole year. **Conclusions :** Provide a loan in miniature to the leprosy family can increase their family's income and accelerate the ability of their deformity recovery and strength their sociability. **Keywords :** miniature loan; leprosy family; economy; recovery from disability; social communication.

High Degree of Social Restrictions in a Former Leprosy Colony Ceará State, Brazil

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Throughout history, leprosy patients have been suffering not only from physical disabilities, but also from social exclusion. This study aims to measure the social restriction perceived by ex-leprosy patients residing in a former leprosy colony in Redenção Municipality, Ceará State (North-East Brazil). We used Van Brakel's Participation Scale, an interview-based instrument assessing client-perceived social participation on a score system (0-90 points). It is used in leprosy patients, but has so far not been applied in a former leprosy colony. We obtained data from 77 (85,6%) of the 90 leprosy-affected residents of the colony who have been successfully treated. In total, 52% showed social restrictions, indicated by a score >12 points. Restrictions were mainly related to working and travelling and less common in activities in the closer community. Social participation was significantly lower in individuals with mobility restrictions ($p<0,001$), and visible deformations ($p=0,01$). The perceived restriction of social participation is an important consequence of leprosy among the population of a former leprosy colony in North-East Brazil.

Teleassistance and Teleeducation in Leprosy : A Strategy of Public Health Program

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Leprosy is a chronic infectious disease, which provokes disability, a problem of public health in endemic countries, such as Brazil. The diagnosis is based on anamnesis (anesthesia) and clinical examination (macula on the skin). The sending of the patient's history and digital images to advanced technology centers stimulates an interactive discussion and the discharge of an effective and quick second opinion. The data of 106 suspicions cases of leprosy sent of Health Unity to Clinical Hospital are compatible with the ones from the literature in Teledermatology, Kappa medial agreement, especially because leprosy is a polymorphous disease hence it is difficult to make a diagnosis in the indefinite forms and initial lepromatosis being differentiated in general by the history of anesthesia. This project using Telemedicine and Teleeducation tools in the FMUSP-SP with the participation Municipal and State Health Secretariat of Sao Paulo, which are catalyzing this initiative to increase the chances of diagnosis and treatment, as one of the strategies of the leprosy program.

Immediate Active Mobilization of Common Tendon Transfers : Economic and Social Impact of the New Postoperative Therapy Protocol

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Purpose : To assess the economic and social impact of quicker rehabilitation, earlier discharge from care and more rapidly functional restoration with the new postoperative protocol of immediate postoperative active mobilization following tendon transfers. **Methodology :** In the years 2003-2006, 124 patients had immediate mobilization of tendon transfer following claw correction by Zancolli's "lasso"; opposition transfer and tibialis posterior transfer for foot drop correction. The outcomes of surgery were similar to those of immobilization of the transfer with earlier discharge of patients after completion of rehabilitation. The economic impact of immediate mobilization versus immobilization was determined by the total man days saved, lower hospital cost, reduced therapist time and earlier return to work. **Result :** There is 40% reduction in hospitalization and 2444 man days saved with immediate postoperative active mobilization of tendon transfer. Therapist's time per session is reduced by 50% and the overall savings for the programme in financial terms is enormous. Patients returned home three weeks earlier and this was a positive motivating factor for patients' willingness to undergo similar surgery again. **Conclusion :** Immediate mobilization of tendon transfer is safe. The outcomes are similar to postoperative immobilization with significant economic and social advantages to the patient and service provider.

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Life Histories of People Affected with Leprosy and Subjected to Compulsory Isolation : Emotional and Social Effects

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For many years, people affected with leprosy were excluded from society by being compulsorily isolated in big leprosariums. This work aims at identifying the emotional and social burden upon people affected by leprosy and subjected to compulsory isolation in leprosariums in Brazil. The approach was qualitative, based on oral accounts using interviews with ex-residents in leprosariums as a technique, and 15 people were interviewed. The transcribed material was selected with the purpose of identifying emotional and social burden, and the most significant themes resulting from the interviews were organized. The results showed that those isolated had been abruptly withdrawn from their homes, segregated and shunned by society, separated from their families, and had their newborn babies taken away from their arms. Therefore, such reports enable to know such persons' emotional and social trajectory, in addition to being a relevant knowledge source and historic documentation. Such life histories are confounded with the history of leprosy in Brazil. **Keywords** : leprosy, isolation.

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Factors Associated with Low Self-Esteem Among Leprosy Affected Persons in Bara District, Nepal

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This study seeks the factors related with lowering of self-esteem among leprosy affected persons of Jeetpur VDC of Bara district. A pre-tested interview-schedule on self-esteem was used to collect necessary data on a sample of 50 patients. In 94%, the disease was known to the family, of which in 53%, the relationship was not changed. 17% thought that they gained more support. 26% did not disclose to their relatives and neighbors due to the fear of rejection. In 42%, there was significant lowering of self-esteem, due to fear of deformity, stigma, and uncertainty of future or difficulty in social relationships. Age groups (50-59), Very poor economic conditions, marital status and treatment status are factors in patients who have lost self-esteem. **Key words**: low self esteem, low self esteem in leprosy.

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Reasons for People Affected by Leprosy Joining A Leprosarium in the Noughties in Nepal

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This study was done to explore factors influencing leprosy patients, in choosing institutional living. Semi-structured interviews were conducted on a one to one basis among 38 patients who gained residence and a ration in Khokana during 2000-2006 using a structured interview form. **Results** : The average age of patients entering Khokana was 56 years. 14 were female (41%). The average length of time each person was affected by Leprosy was 36.3 years; with only 5 patients who were affected for less than 20 years. 3 people had WHO grade I deformity and the remaining 31 had grade II. Two of the people with grade I Leprosy were married to another person affected by Leprosy. 12 people had no contact with their family (35%). 16 people came with a family member and the other 16 came alone. 1 of those in the later group later married, and another was joined by his sons at a later date. 25 (73%) people gave the principal reason for gaining a place in Khokana as food security (including those whose disability made them unable to work). 6 (17%) gave community or family rejection as their reason for choosing to live there. 2 people said that ease of availability of medical treatment was their deciding factor and 1 patient didn't answer. **Conclusion** : Meeting of people's basic needs (i.e., food, shelter, children's security) rather than stigma or community rejection is the main cause of people choosing to live in Khokana in the last 7 years. Newly admitted people are mostly elderly, with bad deformity and have been affected by Leprosy for many years. **Key words** : reasons for joining leprosarium.

Perception of Children of People with Leprosy about Future Life

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Numerous papers have been published regarding the physical, social, economical and psychological condition of people with leprosy. But there are rare publication regarding future of the children of parents with leprosy. There are three institutions in Kathmandu. About four hundred families affected by leprosy have taken refuge in these institutions. Khokana Leprosarium is supported by Government and other two are under management of national NGO. Government provides food and accommodation to an individual irrespective of family size. Government does not have provision of income generating activities in this institution. Few question "How to educate children" and "How will survive the children in tough competitive world" poses challenges to the residents. Khokana Leprosarium is accessible by public transportation from Kathmandu city. In this study, children, who are living in the institution and age between fifteen and thirty years, are included. This study aimed to explore the perception of those children, as they have to leave the Institution at the condition of death of his/her parent(s), who is receiving grants. Those children self filled up the questionnaire. Some information was collected through interview and FGD with the children and parents. **Key words** : people with leprosy, people affected by leprosy, catch them young.

Counseling Needs for the People Affected with Leprosy

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Introduction : Counseling was introduced as a new initiative in the hospital from 2002. Since then it has been an important part of patient care in the hospital and initially it was only for people with Leprosy. As it is important in the area of patient care which helps to cope with their problems and so it must be emphasized in every hospital. **Methods** : Two cases were studied in detail. **Results** : In these two case studies we found that the patients shared misconceptions about their disease, which lead to depression. Also, their family members had misconceptions and fear about the disease, which needed to be dealt with. So when they went through counseling their attitude about the disease changed and they were more confident then before and also their relationship with the relatives restored. **Conclusion** : As we see that Leprosy affects the life of people and they face psycho-social problems. To cope with this counseling plays an important role for them, which could help them to solve their problems and so it must be emphasized in giving holistic care to the patients. **Key words** : Counseling needs, leprosy.

Insights into the Life in a Former Leprosy Colony : Results from Focus Group Discussions

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To take a deeper look at daily life in a former leprosy colony in northeast Brazil, we performed two focus groups with 18 residents in total. Participants related the colony as being "their place", where they felt free to be as they are, whereas society "outside" was generally perceived as exclusive and with preconceptions. The safety and tranquility of the colony was mentioned by some, whereas others criticized social exclusion and lack of cultural life. Especially younger participants felt stigmatized and stressed difficulties of finding an employment. Many participants had experienced situations of humiliation - some showed deep grief and resignation, others were outraged. A controversial discussion emerged on the question whether the colony's administration was responsible for leisure activities or not. The administration was perceived as a paternalistic institution, not representing their interests properly. The discussions were very lively and emotional, showing the affliction people have experienced for years. Measures need to be taken to fight stigmatization, and to strengthen self-confidence of the residents. They need support to become active in claiming their interests.

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The Social and Psychological Affects of Leprosy : How a Strong Support System and One's Empowerment Can Make a Difference

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The social and psychological affects of leprosy are sometimes more painful than the disease itself. It is also permanent—it can neither be eradicated nor cured. The medications used to treat leprosy and control its reactions such as clofazimine and prednisone can cause side effects like changes in ones complexion and weight gain, as well as new medical problems that also need treatment. These physical changes in your body can be a driving force in telling family and friends about your illness, risking rejection and isolation, or having to come up with constant explanations that are not true, if you decide not to share your illness with others. All of these realities compounded with the uncertainty of one's length of treatment time, the impact being ill can have on your job, family, and every other aspect of your life can cause a person's mental and emotional state to suffer greatly, as well as their self-esteem. A strong support system and the empowerment that comes with learning about one's illness can make all the difference in becoming healthy and staying that way.

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Depression and its Influential Factors Among Hospitalized Cured Leprosy

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Objective : To study the depression and its influential factors of hospitalized cured leprosy cases. **Methods :** Self depression scale (SDS) was administered to 120 lepers lived in Zhejiang Leprosarium, China. And 12 relevant factors, including sex, age, education, marriage, health status, economical level and human relations, et ai, were collected. **Results :** Depression was commonly seen in cured leprosy cases, with a rate of 25% (30/120). 73.33% depression cases were with mild depression level. There was no statistical difference between the depression scores of lepers and that of norms. We found that the main influential factors of depression were age, health status and human relation. **Conclusion :** The patients lived in leprosy colony are also invaded by the depression, similar to the social persons. Taking measures to change the health status and community circumstances of leprosy can improve their metal health status. **Key words :** Leprosy, Depression, Influential factors, Self depression scale (SDS).

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Alexithymia and its Relevant Factors in Cured Patients Lived in Leprosy Colony

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Objective : To investigate the alexithymia and its affected factors in cured patients of leprosy. **Method :** 120 cured lepers were tested with Toronto Alexithymia Scale -26, and the results were analyzed with SPSS 12.0 **Result :** The scores of alexithymia and its factor 1, 2, 4 were higher than those of norm, while that of factor 3 is lower than that of norm. The main relevant factors of alexithymia were general health status, life satisfactory, interpersonal relationship. **Conclusion :** Alexithymia is more likely to be a status response to leprosy and its related psychological and social factors. We must take alexithymia in lepers seriously, eliminate the affected factors, and carryon psychological intervention, to improve the health levels of lepers. **Key words :** Leprosy, alexithymia, relevant factor.

Poster Presentations History

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Leprosy in Turkey

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Introduction : The history of Leprosy in Turkey will give in this article. **Methodology :** The history and experiences of leprosy works in Turkey will collect and present as a poster. **Results :** During the 19th century, a prominent doctor of the Ottoman era, Zambako Pasha has looked into this subject but has given exaggerated estimated results. For example, he has suggested the number 600,000. Associate Professor Dr. Etem Utku from Ankara estimated 40,000 patients. There are 3 leprosy hospital in country and all of them has been realised under the title of **National Leprosy Control Program**, through using the facilities of Association for Fighting Leprosy, Ministry of Health and Faculty of Medicine of Istanbul and joint use of resulting data and by receiving consultancy services from the World Health Organization. The number 2,500 has been reached during the 2000's after starting off with 10,000 records, eliminating a lot of deaths and correcting a number of wrong diagnose and double recording. There are a few new diagnoses each year. **Conclusions :** According to the official records, 2599 patients exist during 2007. The number of diagnosed cases during 2006 are 7. **Key Words :** Leprosy, Turkey.

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The Star : Informing the World About Leprosy

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On March 10, 1941, the National leprosarium in Carville, Louisiana (USA) started to administer dapsone to ten volunteers who resided on the 350-acre facility surrounded by a large meandering river and a swamp full of alligators. One of the volunteers eventually published the results of this Miracle at Carville. However, it was the monthly reporting by The STAR that residents of other leprosaria also surrounded by menacing rivers and other barriers learned about this wonderful cure. This display is designed to show how a resident operated magazine, spearheaded by Stanley Stein, crossed international boundaries and offered hope to others affected by leprosy. On the eve of the 68th anniversary of the day which helped to eliminate the "chaulmoogra salute" (residents with bent arms in an upright position after receiving their injection of chaulmoogra oil), everyone at the Congress should have an opportunity to witness once more a replica of the bottle used to hold this unique white pill.

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Leprosy and Immigration : A Study on the Occurrence of the Disease in Foreigners in Sao Paulo – Brazil 1924 - 1943

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Leprosy is a disease, which incidence in Brazil can be traced since colonial times. Strong stigmatization and fear of infection contributed for the search of ways to segregate the patients from society by the government. However, only in the beginning of the 20th century, the real confinement took place through the compulsory confinement politics. The fast growth in number of patients in the State of Sao Paulo coincided with a period of great economic growth and arrival of a great number of immigrants during the first decades of the century, forcing the creation of a system of asylums big enough to accommodate all the infected people. Those asylums were run with strict organization and rigorous physical as well as bureaucratic control. The objective of this research was to analyze that disease's path and its incidence on different groups of immigrants. **Methodology :** We analyzed the specific bibliography on leprosy and immigrational movements, and medical articles. More than 7,000 medical records concerning patients admitted to hospitals in the State of Sao Paulo between 1924 and 1945 were analyzed. The incidence of the disease among different nationalities, gender and clinical form was also analyzed, and the data, compared to the one referred to the natives from the country. **Results :** We verified that leprosy would affect mostly the foreigners and their descendents born in Brazil, being those two groups responsible for 48% of the cases during that period; that the highest incidence was on males, which group was multibacillary in their majority. **Keywords :** leprosy, immigration, epidemiology.

Poster Presentations Ocular Leprosy

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Eye Care to Inmates of Aged and Destitute Homes (Snehalayas) of The Leprosy Mission

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The Leprosy Mission, India runs five Snehalayas- Mercy homes for those Leprosy affected persons having no one to care for them. One of the activities of TLM community eye care programme is to provide comprehensive eye care to these inmates and to enable them to lead an independent and better quality life. The eye care activities include regular eye check-up by the TLM Ophthalmic team providing spectacles, Cataract surgical services, mobility training and Daily living skills enabling them to lead an independent life. There are 205 inmates in 5 Snehalayas. The ocular morbidity among the inmates will be described. 10 inmates are irreversibly blind. They have been given mobility training. The improvement in the quality of life and the independence in mobility of these inmates will be illustrated through photographs. **Key words:** eye care, aged and destitute homes.

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Ocular Morbidity of Leprosy in-Patients at Philadelphia Leprosy Hospital, Salur, Andhra Pradesh, India

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The ocular involvement in leprosy can take the form of both infiltrative and inflammatory lesions. While inflammatory changes appear early, the symptoms of infiltrative changes may be delayed by many years. Ocular lesions in leprosy are very damaging and 6 monthly examinations are generally recommended. Since ocular involvement can be disabling, leading to loss of employment and curtailment of normal activities, it is essential that eye care and prevention of sequelae of damage to the eyes be a part of routine care of leprosy patients. A study was undertaken to assess the impact of POID activities on the ocular morbidity pattern of leprosy patients. A sample of 596 medical case records of all admissions to the leprosy wards of Philadelphia Leprosy Hospital, Salur in the calendar year 2006 were analyzed and relevant inferences were drawn. **Key words :** ocular disorders in leprosy, ocular morbidity in leprosy.

Missed / Misplaced / Late Abstracts

L-14

Nerve Regeneration and Repair

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If the axon is spared, such as in first-degree injury, conduction is interrupted due to demyelination, but it is reinstated whenever the aggravating stimulus is removed and the myelin layers are restored. If the axon, or more, is transected, causing a second to fifth-degree injury, the response has two main phases i.e. degeneration and regeneration, taking substantially longer. The degeneration is known as Wallerian degeneration. The changes that occur in the axon, cell body and the Schwann cell covering of the nerve, help in the preparation ready for regeneration. Distally, the axon begins to disintegrate and undergoes apoptosis, releasing vesicles of cytosol and organelles. This same process occurs proximally and is stopped by the regeneration process. The local Schwann cells with macrophages, that migrate across the local vessels and clean up the apoptotic debris, create long, clean, endoneurial tubes. Schwann cells begin to proliferate and organize themselves into columns that lie within the endoneurial tubes, creating what are known as the bands of Bungner. The motor end-plates disappear at the neuromuscular junction. While the distal portion of the nerve is being cleared and prepared for reinnervation, the proximal portions of the neurons are going through a process of regeneration. Immediately after injury, the cell body swells, the nucleus becomes hypochromatic and increases the production of mRNA and proteins instead of neurotransmitters. These products are transported down the axon, providing the material and energy for nerve elongation to the distal tip. While the cell body is busy making raw materials, the newly severed axon end begins to sprout, initially sending out transient axonal processes that are retracted and replaced by more permanent filopodia that contain a cytoskeleton and are capped by an expanded region known as the growth cone (it seems that each axon produces about 30 sprouts). The growth sends out many small processes that seek specific markers, which influence the axon in its movements to preferentially select neural tissue and even exhibit a preference for endoneurial tubes that have the same function (neurotropism). For instance, when a motor axon reaches a nerve gap, it moves across small gaps into the severed distal end and finds a motor tube to begin growing down. Although this does help to preserve function, it is, unfortunately, not specific enough to recreate innervations identical to those that existed prior to injury. The axon's response is known to be regulated by chemical signals that exhibit neurotropic and neurotrophic influences. Neurotropic factors are responsible for directing and attracting the regenerating axons. Neurotrophic factors are involved in inducing the maturation and elongation of the axon. Macrophages, Schwann cells, and other supporting cells in the area release these chemical factors and attempt to create a microenvironment that promotes axon elongation. Limits exist on directing axon regeneration e.g. if the nerve is too close, the axons cannot exhibit specificity of function, causing severely aberrant patterns of innervation at an end organ level.

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Risk Factors for the Development of Nerve Impairment

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The focus will be on clinical risk factors and changes in nerve status identified by monofilament or voluntary muscle testing. The presentation will include a summary of risk factors reported in published work and discussion of the impact of differences in clinical definitions and in statistical approaches. Where available, the predictive value of the reported risk factors will be assessed using data from the INFIR cohort study.

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Temporalis muscle transfer (TMT) is a surgical technique that can be used to correct lagophthalmos in patients with facial nerve involvement in leprosy. This retrospective study of TMT in 73 eyes was conducted in order to determine the degree of success of TMT in achieving full lid closure, therefore preventing damage to the cornea. The average lid gap on light closure was 7.10mm preoperatively and 2.67mm postoperatively. The average lid gap on tight closure was 4.29mm preoperatively and 0.20 mm at discharge post- TMT. At discharge, 85% of the eyes could achieve full lid closure with no measurable gap. **Key words :** Temporalis muscle transfer in leprosy.

The Histological Diagnosis of Leprosy Type I Reactions : Identification of Key Variables and an Analysis of the Process of Histological Diagnosis

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This study identified the variables that pathologists use to make a diagnosis of Type 1 leprosy reaction. **Design :** Prospective study in India with skin biopsies taken from 99 patients with clinically diagnosed reactions and 52 non-reactional controls. These were assessed by four histopathologists. **Results :** Reactions were under-diagnosed with 32-62% of clinically diagnosed reactions being given that histological diagnosis. The pathologists had good specificities (range 72%- 93%) but poorer sensitivities (range 42-78%). The major histological features of TIR were cell maturity, oedema and giant cells. Five variables were used to diagnose reactions: intra-granuloma oedema, giant cell size, giant cell numbers, dermal oedema and HLA-DR expression. A predictive model for the diagnosis of TIR was developed using stepwise logistic regression analysis with clinical diagnosis of reaction as an outcome and then identifying the key variables that each pathologist used, 34-53% of the variation between pathologists could be accounted for. The four pathologists had similar diagnostic models and their estimations of epithelioid cell granuloma oedema, dermal oedema, plasma cells and Granuloma fraction estimation were significant variables in diagnosing TIR. Each pathologist then added in variables that were specific to them. **Conclusion :** TIR are histologically under-diagnosed and has identified key variables for diagnosing TIR.

The Clinical and Histological Diagnosis of Reactions in Patients with Clinically Diagnosed Multibacillary Leprosy- the INFIR Cohort

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We report on three aspects of histological diagnosis from the INFIR cohort (n=303). **Diagnosis of leprosy :** The BT diagnosis group was heterogeneous with 59% being confirmed histologically, 13% were re-assigned to BL, 2 to LL, 32 and 15 to indeterminate and NSL respectively. **Indeterminate/Resolved leprosy :** 62 patients had a diagnosis of indeterminate or no significant lesion (NSL) on biopsy. The final classification for this group of 62 patients was BT 50, BL 3, BT (PN) 4 and BL (PN) 5. **Clinical and Histological Diagnosis of reactions :** The histopathologist diagnosed 52%, 39 and 9% of the BT, BL and LL patients as being in TIR. Clinicians diagnosed TIR in 36 patients whereas using histology a further 63 patients were diagnosed in TIR; in 18 patients there was a clinical diagnosis of TIR without histological confirmation. **Conclusions :** 1. The MB diagnostic group is very heterogeneous. 2. Indeterminate/ resolved leprosy is a substantial category. 3. Reactions are diagnosed differently by clinicians and histopathologists. 4. For research it is important that pre-agreed gold standards are used.

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More Emphasis is paid on Disability Prevention and Medical Rehabilitation (DPMR) services under National Leprosy Eradication Program (NLEP) during 11th five year plan. Participatory and integrated approach is the main principle. Basic services of nerve function monitoring, management of Leprosy Reaction & Neuritis (LR/N) and ulcer care will be provided by General Health Care (GHC) staff at primary and secondary level. Cases requiring surgery and complication management will be referred to tertiary care centers. Operational Guidelines and standardized training modules for different categories prepared by experts have been issued. Enough provision of Prednisolone, MCR foot wear and other aids have been made. Inter-ministerial links have been developed. NRHM umbrella has been taken as opportunity. PMR departments of Medical colleges have been involved. Support to NGOs, community based organizations and NLEP agencies to strengthen CBR and development of Self Help Groups is well considered. Networking of Disabled Peoples Organizations (DPO) and NGOs will further promote the Disability Prevention and Rehabilitation services.

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The normal foot is well protected from abnormal pressure due to feeling of pain & discomfort. One of the most disabling sequel of leprosy is the deformed foot due to motor weakness, sensory loss and dryness. This leads to ulceration, chronic infection & disintegration of small bones of the foot. It is essential to understand the mechanism of ulceration & management with the help of various techniques of off loading/weight relieving from foot. Every leprosy individual should be taught self care of foot & emphasis should be given for selection of proper footwear.

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IDEA India was responsible to conduct the survey of leprosy colonies in India. The process of identifying the States for the study was started in 2005 June and in July the coordinators and field worker to collect the data in 23 states was finalised. The Nippon Foundation, Japan provided necessary funds to carry out the survey. A questionnaire was prepared by Dr.P.K.Gopal and it was translated in local languages by the respective State coordinators. One questionnaire was used for all the 23 States to collect data. The work involved 23 states with 12 different languages and was done by a team of workers and coordinators. The survey identified 631 self settled leprosy colonies in India. Our concern was mainly the affected persons and as such, the non-affected persons were not dealt in detail. The total number of children affected by leprosy is 10941. The point to stress is that 27368 persons are begging. This what we are more concerned with, since more than half of the population has no income except by way of begging. The leprosy colonies in eastern states have less number of people and economically backward. The leprosy colonies in Maharashtra State are economically better. In the leprosy colonies in the Northern states many people who migrated from Southern part of India are found. They moved to North due to high level of stigma in the South.

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Declining trends of NCDR is not observed through out the world. No reliable tool to accurately measure sub clinical infection. Either the dynamics of transmission or the early evolution of disease in leprosy not yet understood. Clinical and epidemiological study during the year 1991-1995 revealed basic science and unrecognised clinical features. Four major criteria are used to diagnose. All human diseases are the outcome of basic leprosy manifestation, types of diseases and clinical manifestations is determined by genetic constitution. Upset in Thridoshas can be discussed as metabolic and morphological changes by infestation of leprosy. Leprosy affects all organs through direct invasion on nerve cells and endothelial tissues. Also affects organs through mediators like prostaglandin, kinin and neuro transmitters. It may be responsible for immuno modulation and oxidative changes in tissues. Man gets leprosy infection during conception after birth at any time. All are born with leprosy, living with leprosy and dying with leprosy. We failed to co-relate the science symptoms of disease with leprosy till date. CLTRI study using PGL-I antibody test reveal all population examined is positive for the test, noting 100% infection. Elimination of leprosy means elimination of mankind.

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Leprosy combatants and their allies have launched into a joint program of worldmaking at Anandwan in Warora in the district of Chandrapur in Maharashtra in Central India. In the course of this paper an effort is made to appreciate and understand the attempts made by leprosy combatants to search for coherence and continuity in their lives. The focus of our narrative is one Mr. Tukaram Urade, a guy inspired by the vision, teaching and praxis of the world renowned Baba Amte, one of the few surviving close companions of the late Mohandas Karamchand Gandhi better known as Mahatma Gandhi. Tukaram says, "the mid 1960's he began to notice some white patches on his body. Initially no one gave much importance or attention to these minor signs of a major thing to come. He says, 'prior to me there was no one in our family who had any history of leprosy'. As days, weeks, months and years went by, his situation began to change. Intake and application of local herbs on the affected parts of his body showed no positive effects. Native healers known to effect cures through mantras and spiritual exercises were unable to set things right for Tukaram. Having tried and failed to get going, gutsy guy that he is, 'Tukaram decides to give yet another try and arrives at Anandwan on April, 1, 1969. He says "from April 1 to August 15, I stayed at Anandwan, received timely treatment, got rid of the wounds and sores, loved the place and decided to live and work with fellow combatants for the rest of my life. On August 16, I left for Somnath and remained there till 1973. In the beginning we were 14 members in the Somnath team, transforming Somnath into Anandwan's main hub for agricultural enterprise". Somnath has become the "Rice Bowl" of Anandwan and its communes says Tukaram, now happily enjoying the fruits of his retirement in Anandwan. **Key words :** Anandwan, leprosy, disability, Baba Amte, empowerment, worldmaking.

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